

## INDEX OF EXHIBITS

EXHIBIT	Title/Description
1	Excerpted pages from U.S. EPA, Final Rule: National Ambient Air Quality Standards for Particulate Matter. 62 Fed. Reg. 38,652 (July 18, 1997)
2	Excerpted pages from U.S. EPA, Final Rule: National Ambient Air Quality Standards for Particulate Matter, 78 Fed. Reg. 3086 (January 15, 2013)
3	Excerpted pages from U.S. EPA, Final Rule: Regional Haze Regulations, 64 Fed. Reg. 35714 (July 1, 1999)
4	Excerpted pages from Whiting Refinery's Title V operating permit, Significant Permit Modification No. 089-40517-00453 (effective September 20, 2019)
5	IDEM Office of Air Quality, Notice of Violation to BP Products North America Inc. (March 21, 2019)
6	IDEM Office of Air Quality, Notice of Violation to BP Products North America Inc. (August 1, 2017)
7	IDEM Office of Air Quality, Notice of Violation to BP Products North America Inc. (December 15, 2017)
8	Excerpted Compliance Certifications for January 28, 2016 Test Report for Boiler 32.
9	Declaration of Sanghyun Lee, Counsel for Plaintiff Sierra Club
10	Excerpted pages from U.S. EPA, Memorandum re: Timely and Appropriate Enforcement Response to High Priority Violations (Aug. 25, 2014)
11	Excerpted pages from U.S. EPA, Final Rule: Methods for Measurement of Filterable PM <sub>10</sub> and PM <sub>2.5</sub> and Measurement of Condensable PM Emissions From Stationary Sources, 75 Fed. Reg. 80,118 (Dec. 21, 2010)
12	Excerpted pages from U.S. EPA, Final Rule: Testing Regulations for Air Emission Sources [Method 5 revisions], 83 Fed. Reg. 56,713 (Nov. 14, 2018)
13	Declaration of Sierra Club member Patricia Macielewicz
14	Declaration of Sierra Club member Carolyn Marsh
15	Declaration of Sierra Club member Maureen Connolley

# EXHIBIT 1

# ENVIRONMENTAL PROTECTION AGENCY

## 40 CFR Part 50

[AD-FRL-5725-2]

RIN 2060-AE66

## National Ambient Air Quality Standards for Particulate Matter

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** This document describes EPA's decision to revise the national ambient air quality standards (NAAQS) for particulate matter (PM) based on its review of the available scientific evidence linking exposures to ambient PM to adverse health and welfare effects at levels allowed by the current PM standards. The current primary PM standards are revised in several respects: Two new PM<sub>2.5</sub> standards are added, set at 15 µg/m<sup>3</sup>, based on the 3-year average of annual arithmetic mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors, and 65 µg/m<sup>3</sup>, based on the 3-year average of the 98<sup>th</sup> percentile of 24-hour PM<sub>2.5</sub> concentrations at each population-oriented monitor within an area; and the current 24-hour PM<sub>10</sub> standard is revised to be based on the 99<sup>th</sup> percentile of 24-hour PM<sub>10</sub> concentrations at each monitor within an area. The new suite of primary standards will provide increased protection against a wide range of PM-related health effects, including premature mortality and increased hospital admissions and emergency room visits, primarily in the elderly and individuals with cardiopulmonary disease; increased respiratory symptoms and disease, in children and individuals with cardiopulmonary disease such as asthma; decreased lung function, particularly in children and individuals with asthma; and alterations in lung tissue and structure and in respiratory tract defense mechanisms. The current secondary standards are revised by making them identical in all respects to the new suite of primary standards. The new secondary standards, in conjunction with a regional haze program, will provide appropriate protection against PM-related public welfare effects including soiling, material damage, and visibility impairment. In conjunction with the new PM<sub>2.5</sub> standards, a new reference method has been specified for monitoring PM as PM<sub>2.5</sub>.

**EFFECTIVE DATE:** This action is effective September 16, 1997.

**ADDRESSES:** A docket containing information relating to the EPA's review

of the PM primary and secondary standards (Docket No. A-95-54) is available for public inspection in the Central Docket Section of the U.S. Environmental Protection Agency, South Conference Center, Rm. 4, 401 M St., SW., Washington, DC. This docket incorporates the docket established for the air quality Criteria Document (Docket No. ECAO-CD-92-0671). The docket may be inspected between 8 a.m. and 3 p.m., Monday through Friday, except legal holidays, and a reasonable fee may be charged for copying. The information in the docket constitutes the complete basis for the decision announced in this document. For the availability of related information, see "SUPPLEMENTARY INFORMATION." **FOR FURTHER INFORMATION CONTACT:** John H. Haines, MD-15, Air Quality Strategies and Standards Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711; telephone: (919) 541-5533; e-mail: haines.john@epamail.epa.gov.

### SUPPLEMENTARY INFORMATION:

#### Related Final Rules on PM Monitoring

In a separate document published elsewhere in this issue of the **Federal Register**, EPA is amending its ambient air quality surveillance requirements (40 CFR part 58) and its ambient air monitoring reference and equivalent methods (40 CFR part 53) for PM.

#### Availability of Related Information

Certain documents are available from the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. Available documents include:

- (1) Air Quality Criteria for Particulate Matter (Criteria Document) (three volumes, EPA/600/P-95-001aF thru EPA/600/P-95-001cF, April 1996, NTIS #PB-96-168224, \$234.00 paper copy).
- (2) Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information (Staff Paper) (EPA-452/R-96-013, July 1996, NTIS #PB-97-115406, \$47.00 paper copy and \$19.50 microfiche). (Add a \$3.00 handling charge per order.)

A limited number of copies of other documents generated in connection with this standard review, such as technical support documents pertaining to air quality, monitoring, and health risk assessment, can be obtained from: Environmental Protection Agency Library (MD-35), Research Triangle Park, NC 27711, telephone (919) 541-2777. These and other related documents are also available for

inspection and copying in the EPA docket at the address under "ADDRESSES," at the beginning of this document.

### Electronic Availability

The Staff Paper and human health risk assessment support documents are available on the Agency's Office of Air Quality Planning and Standards' (OAQPS) Technology Transfer Network (TTN) Bulletin Board System (BBS) in the Clean Air Act Amendments area, under Title I, Policy/Guidance Documents. To access the bulletin board, a modem and communications software are necessary. To dial up, set your communications software to 8 data bits, no parity and one stop bit. Dial (919) 541-5742 and follow the on-screen instructions to register for access. After registering, proceed to choice "<T> Gateway to TTN Technical Areas", then choose "<E> CAAA BBS". From the main menu, choose "<1> Title I: Attain/Maint of NAAQS", then "<P> Policy Guidance Documents." To access these documents through the World Wide Web, click on "TTN BBSWeb", then proceed to the Gateway to TTN Technical areas, as above. If assistance is needed in accessing the system, call the help desk at (919) 541-5384 in Research Triangle Park, NC.

### Implementation Strategy For Revised Air Quality Standards

On Wednesday, July 16, 1997, President Clinton signed a memorandum to the Administrator specifying his goals for the implementation of the O<sub>3</sub> and PM standards. Attached to the President's memorandum is a strategy prepared by an interagency Administration group outlining the next steps that would be necessary for implementing these standards. The EPA will prepare guidance and proposed rules consistent with the President's memorandum. Copies of the Presidential document are available in paper copy by contacting the U.S. Environmental Protection Agency Library at the address under "Availability of Related Information" and in electronic form as discussed above in "Electronic Availability."

The following topics are discussed in this preamble:

- I. Background
  - A. Legislative Requirements
  - B. Related Control Requirements
  - C. Review of Air Quality Criteria and Standards for PM
  - D. Summary of Proposed Revisions to the PM Standards
- II. Rationale for the Primary PM Standards
  - A. Introduction
  - B. Need for Revision of the Current Primary PM Standards

#### *D. Summary of Proposed Revisions to the PM Standards*

For reasons discussed in the proposal, the Administrator proposed to revise the current primary standards for PM (as indicated by PM<sub>10</sub>), by adding two new primary PM<sub>2.5</sub> standards set at 15 µg/m<sup>3</sup>, annual mean, and 50 µg/m<sup>3</sup>, 24-hour average. The proposed annual PM<sub>2.5</sub> standard would be based on the 3-year average of the annual arithmetic mean PM<sub>2.5</sub> concentrations, spatially averaged across an area. The proposed 24-hour PM<sub>2.5</sub> standard would be based on the 3-year average of the 98<sup>th</sup> percentile of 24-hour PM<sub>2.5</sub> concentrations at each population-oriented monitor within an area. The proposal solicited comment on two alternative approaches for selecting the levels of PM<sub>2.5</sub> standards. The Administrator also proposed to revise the current 24-hour primary PM<sub>10</sub> standard of 150 µg/m<sup>3</sup> by replacing the 1-expected-exceedance form with a 98<sup>th</sup> percentile form, averaged over 3 years at each monitor within an area, solicited comment on an alternative proposal to revoke the 24-hour PM<sub>10</sub> standard, and proposed to retain the current annual primary PM<sub>10</sub> standard of 50 µg/m<sup>3</sup>. The proposal also solicited comment on proposed revisions to 40 CFR part 50, Appendix K to establish new data handling conventions for calculating 98<sup>th</sup> percentile values and spatial averages, revisions to 40 CFR part 50, Appendix J to modify the reference method for monitoring PM as PM<sub>10</sub>, and a proposed new reference method for monitoring PM as PM<sub>2.5</sub> (40 CFR part 50, Appendix L).

With regard to the secondary standards, the Administrator proposed to revise the current secondary standards by making them identical to the suite of proposed primary standards, in conjunction with the establishment of a regional haze program under section 169A of the Act.

## **II. Rationale for the Primary Standards**

### *A. Introduction*

1. *Overview.* This document presents the Administrator's final decisions regarding the need to revise the current primary ambient air quality standards for PM, and, more specifically, regarding the establishment of new annual and 24-hour PM<sub>2.5</sub> primary standards and revisions to the form of the current 24-hour PM<sub>10</sub> primary NAAQS. These decisions are based on a thorough review, in the Criteria Document, of the latest scientific information on known and potential human health effects associated with exposure to PM at levels typically found

in the ambient air. These decisions also take into account:

(1) Staff Paper assessments of the most policy-relevant information in the Criteria Document, upon which staff recommendations for new and revised primary standards are based.

(2) CASAC advice and recommendations, as reflected in discussions of drafts of the Criteria Document and Staff Paper at public meetings, in separate written comments, and in the CASAC's closure letters to the Administrator.

(3) Public comments received during the development of these documents, either in connection with CASAC meetings or separately.

(4) Extensive public comments received on the proposed decisions regarding the primary PM standards.

After taking this information and comments into account, and for the reasons discussed below in this unit, the Administrator concludes that revisions to the current primary standards to provide increased public health protection against a variety of health risks are appropriate. More specifically, the Administrator has determined that it is appropriate to establish new annual and 24-hour PM<sub>2.5</sub> standards, to revise the current 24-hour PM<sub>10</sub> standard, and to retain the current annual PM<sub>10</sub> standard. As discussed more fully below in this unit, the rationale for the final decisions regarding the PM primary NAAQS includes consideration of:

(1) Health effects information, and alternative views on the appropriate interpretation and use of the information, as the basis for judgments about the risks to public health presented by population exposures to ambient PM.

(2) Insights gained from a quantitative risk assessment conducted to provide a broader perspective for judgments about protecting public health from the risks associated with PM exposures.

(3) Specific conclusions regarding the need for revisions to the current standards and the elements of PM standards (i.e., indicator, averaging time, form, and level) that, taken together, would be appropriate to protect public health with an adequate margin of safety.

As with virtually any policy-relevant scientific research, there is uncertainty in the characterization of health effects attributable to exposure to ambient PM. As discussed in the proposal, however, there is now a greatly expanded body of health effects information as compared with that available during the last review of the PM standards. Moreover, the recent evidence on PM-related health effects has undergone an

unusually high degree of scrutiny and reanalysis over the past several years, beginning with a series of workshops held early in the review process to discuss important new information. A number of opportunities were provided for public comment on successive drafts of the Criteria Document and Staff Paper, as well as for intensive peer review of these documents by CASAC at several public meetings attended by many knowledgeable individuals and representatives of interested organizations. In addition, there have been a number of important scientific conferences, symposia, and colloquia on PM issues, sponsored by the EPA and others, in the U.S. and abroad, during this period. While significant uncertainties exist, the review of the health effects information has been thorough and deliberate. In the judgment of the Administrator, this intensive evaluation of the scientific evidence has provided an adequate basis for regulatory decision making at this time, as well as for the comprehensive research needs document recently developed by EPA, and reviewed by CASAC and others, for improving our future understanding of the relationships between ambient PM exposures and health effects.

The health effects information and human risk assessment were summarized in the proposal and are only briefly outlined below in this unit. Subsequent units provide a more complete discussion of the Administrator's rationale, in light of key issues raised in public comments, for concluding that it is appropriate to revise the current primary standards (Unit II.B. of this preamble) and to revise the specific elements of the standards including indicator (Unit II.C. of this preamble); averaging time, form, and level of new PM<sub>2.5</sub> standards (Units II.D., II.E., and II.F. of this preamble); and averaging time, form, and level of revised PM<sub>10</sub> standards (Unit II.G. of this preamble).

2. *Summary of the health effects evidence.* In brief, since the last review of the PM criteria and standards, the most significant new evidence on the health effects of PM is the greatly expanded body of community epidemiological studies. The Criteria Document stated that these recent studies provide "evidence that serious health effects (mortality, exacerbation of chronic disease, increased hospital admissions, etc.) are associated with exposures to ambient levels of PM found in contemporary U.S. urban airsheds even at concentrations below current U.S. PM standard" (U.S. EPA, 1996a; p. 13-1). Although a variety of



responses to constituents of ambient PM have been hypothesized to contribute to the reported health effects, the relevant toxicological and controlled human studies published to date have not identified any accepted mechanism(s) that would explain how such relatively low concentrations of ambient PM might cause the health effects reported in the epidemiological literature.

Unit II.A. of the proposal further outlines key information contained in the Criteria Document, Chapters 10-13, and the Staff Paper, Chapter V, on the known and potential health effects associated with airborne PM, alone and in combination with other pollutants that are routinely present in the ambient air. The information highlighted there summarizes:

(1) The nature of the effects that have been reported to be associated with ambient PM, which include premature mortality, aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions and emergency room visits, school absences, work loss days, and restricted activity days), changes in lung function and increased respiratory symptoms, changes to lung tissues and structure, and altered respiratory defense mechanisms.

(2) Sensitive subpopulations that appear to be at greater risk to such effects, specifically individuals with respiratory disease and cardiovascular disease and the elderly (premature mortality and hospitalization), children (increased respiratory symptoms and decreased lung function), and asthmatic children and adults (aggravation of symptoms).

(3) An integrated evaluation of the health effects evidence, with an emphasis on the key issues raised in assessing community epidemiological studies, including alternative interpretations of the evidence, both for individual studies and for the evidence as a whole.

(4) The PM fractions of greatest concern to health.

The summary in the proposal will not be repeated here. EPA emphasizes that the final decisions on these standards take into account the more comprehensive and detailed discussions of the scientific information on these issues contained in the Criteria Document and Staff Paper, which were reviewed by the CASAC and the public.

3. *Key insights from the risk assessment.* The Staff Paper presents the results of a quantitative assessment of health risks for two example cities, including risk estimates for several categories of health effects associated

with: existing PM air quality levels, projected PM air quality levels that would occur upon attainment of the current PM<sub>10</sub> standards, and projected PM air quality levels that would occur upon attainment of alternative PM<sub>2.5</sub> standards. The risk assessment is intended as an aid to the Administrator in judging which alternative PM NAAQS would reduce risks sufficiently to protect public health with an adequate margin of safety, recognizing that such standards will not be risk-free. The risk assessment is described more fully in the Staff Paper and summarized in the proposal. Related technical reports and updates<sup>7</sup> have been placed in the docket (Abt Associates, 1996a,b; 1997a,b).

EPA emphasizes that it places greater weight on the overall conclusions derived from the studies—that PM air pollution is likely causing or contributing to significant adverse effects at levels below those permitted by the current standards—than on the specific concentration-response functions and quantitative risk estimates derived from them. These quantitative risk estimates include significant uncertainty and, therefore, should not be viewed as demonstrated health impacts. EPA believes, however, that they do represent reasonable estimates as to the possible extent of risk for these effects given the available information. Keeping in mind the important uncertainties inherent in any such analyses, the key insights from the risk assessment that are most pertinent to the current decision include:

(1) Fairly wide ranges of estimates of the incidence of PM-related mortality and morbidity effects and risk reductions associated with attainment of alternative standards were calculated for the two locations analyzed when the effects of key uncertainties and alternative assumptions were considered. Significantly, the combined analysis for these two cities alone found that the risk remaining after attaining the current PM<sub>10</sub> standards was on the

order of hundreds of premature deaths each year, hundreds to thousands of respiratory-related hospital admissions, and tens of thousands of additional respiratory related symptoms in children.

(2) Based on the results from the sensitivity analyses of key uncertainties and the integrated uncertainty analyses, the single most important factor influencing the uncertainty associated with the risk estimates is whether or not a threshold concentration exists below which PM-associated health risks are not likely to occur.

(3) Over the course of a year, the few peak 24-hour PM<sub>2.5</sub> concentrations appear to contribute a relatively small amount to the total health risk posed by the entire air quality distribution as compared to the aggregated risks associated with the low to mid-range concentrations.

(4) There is greater uncertainty about both the existence and the magnitude of estimated excess mortality and other effects associated with PM exposures as one considers increasingly lower concentrations approaching background levels.

#### *B. Need for Revision of the Current Primary PM Standards*

1. *Introduction.* The overarching issue in the present review of the primary NAAQS is whether, in view of the advances in scientific knowledge reflected in the Criteria Document and Staff Paper, the existing PM standards should be revised and, if so, what revised or new standards would be appropriate. The concluding section of the integrative synthesis of health effects information in the Criteria Document, which CASAC characterized as EPA's "best ever example of a true integrative summary of the state of knowledge about the health effects of airborne PM," (Wolff, 1996b) provides the following summary of the science with respect to this issue:

The evidence for PM-related effects from epidemiological studies is fairly strong, with most studies showing increases in mortality, hospital admissions, respiratory symptoms, and pulmonary function decrements associated with several PM indices. These epidemiological findings cannot be wholly attributed to inappropriate or incorrect statistical methods, misspecification of concentration-effect models, biases in study design or implementation, measurement errors in health endpoint, pollution exposure, weather, or other variables, nor confounding of PM effects with effects of other factors. While the results of the epidemiological studies should be interpreted cautiously, they nonetheless provide ample reason to be concerned that there are detectable health effects attributable

<sup>7</sup> The risk assessment results that appear in the Staff Paper and are summarized in the proposal have been updated to include analyses of the particular forms of standard alternatives contained in the proposal and to correct estimates for one effects category (mortality from long-term exposure) to reflect the actual statistics used in the study upon which they were based (Pope et al., 1995). The corrections, which cumulatively reduce estimates of mortality associated with long-term exposures by 20 to 35%, have no effect on risk estimates for mortality associated with short-term exposures or the estimates for any other effects. Because the key sensitivity analyses that provide additional insights regarding thresholds, copollutants, averaging time and related issues involved the short-term exposure studies, none of these results are affected by changes to the long-term exposure risk estimates.

to PM at levels below the current NAAQS. [U.S. EPA, 1996a, p. 13-92]

Given the nature of the health effects in question, this finding, which is based on a large number of studies that used PM<sub>10</sub> measurements, as well as studies using other indicators of PM, clearly indicates that revision of the current PM NAAQS is appropriate. Quite apart from the issue of whether PM<sub>10</sub> should be the sole indicator for the PM NAAQS, the extensive PM epidemiological data base provides evidence of serious health effects (e.g., mortality, exacerbation of chronic disease, increased hospital admissions) in sensitive populations (e.g., the elderly, individuals with cardiopulmonary disease), as well as significant adverse health effects (e.g., increased respiratory symptoms, school absences, and lung function decrements) in children. Moreover, these effects associations are observed in areas or at times when the levels of the current PM<sub>10</sub> standards are met.

Although the increase in relative risk is small for the most serious outcomes, EPA believes it is significant from an overall public health perspective, because of the large number of individuals in sensitive populations that are exposed to ambient PM, as well as the significance of the health effects involved (U.S. EPA, 1996a, p. 1-21). The results of the two-city PM risk assessment reinforce these conclusions regarding the significance of the public health risk—even under a scenario in which the current PM<sub>10</sub> standards are attained.

While the lack of demonstrated mechanisms that explain the extensive body of epidemiological findings is an important caution, which presents difficulties in providing an integrated assessment of PM health effects research, a number of potential mechanisms have been hypothesized in the recent literature (U.S. EPA, 1996b; p. V-5 to V-8; appendix D). Moreover, qualitative information from laboratory studies of the effects of particle components at high concentrations and dosimetry considerations suggest that the kinds of effects observed in community studies (e.g., respiratory and cardiovascular-related responses) are at least plausibly related to inhalation of PM.<sup>8</sup> Indeed, as discussed in the Criteria Document and section V.E of the Staff Paper, the consistency of the results of the epidemiological studies from a large number of different

locations and the coherent nature of the observed effects<sup>9</sup> are suggestive of a likely causal role of ambient PM in contributing to the reported effects.

2. *Comments on scientific basis for revision.* A majority of the public comments received on the proposal agreed that, based on the available scientific information, the current PM<sub>10</sub> standards are not of themselves sufficient to protect public health and it would be appropriate to revise them. Included in those calling for revisions to the current standards are many public health professionals, including numerous medical doctors and academic researchers. For example, a group of 27 members of the scientific and medical community recognized as having substantial expertise in conducting research on the health effects of air pollution stated:

Health studies conducted in the U.S. and around the world have demonstrated that levels of particulate and ozone air pollution below the current U.S. National Air Quality Standards exacerbate serious respiratory disease and contribute to early death. A large body of scientific and medical evidence clearly indicates that the current NAAQS are not sufficiently protective of public health. [Thurston, 1997]

Similar conclusions were reached in a letter signed by more than 1,000 scientists, clinicians, researchers, and other health care professionals (Dickey, 1997). The cosigners to this letter argued that tens of thousands of hospital visits and premature deaths could be prevented with the proposed air quality standard revisions. In fact, these commenters argued that even stronger standards than those proposed by EPA are needed to protect the health of the most vulnerable residents of our communities.

A number of State and local government authorities also submitted comments in support of adopting new air quality standards for fine particulate matter. The commenters concurred with conclusions reached through the EPA's peer review process that the PM standards should be revised to protect public health. A number of these commenters suggested that the standards proposed by EPA should be even stronger, while several other State agencies recommended that EPA adopt PM<sub>2.5</sub> standards, but at less stringent levels. A number of the comments from

states supporting even stronger standards acknowledged the lack of demonstrated mechanism(s) and other uncertainties but stressed the strength of the other evidence in urging EPA to set protective standards.

Many comments were also received from representatives of environmental or community health organizations that supported the adoption of air quality standards for PM<sub>2.5</sub>. These commenters agreed with EPA's finding that a large body of compelling evidence demonstrates that exposure to particulate matter pollution, in general, is associated with premature death, aggravation of heart and lung diseases, increased respiratory illness and reduced lung function. They agreed with EPA that these studies present a consistent and coherent relationship between exposure to PM and both mortality and various measures of morbidity. However, the majority of these commenters argued that EPA's proposed standards for PM<sub>2.5</sub> were inadequate and recommended adoption of more stringent levels of the 24-hour and/or annual air quality standards for PM<sub>2.5</sub>. Many of these commenters also urged EPA to revise the NAAQS for PM<sub>10</sub> to be more protective of public health. These commenters based their recommendations on the findings of the studies that were reviewed in the preparation of the Criteria Document and Staff Paper. One commenter used results from five of these studies as the basis for recommending PM<sub>2.5</sub> standards of 10 µg/m<sup>3</sup> (annual) and 18 µg/m<sup>3</sup> (24-hour) (Dockery et al., 1993; Pope et al., 1995; Schwartz et al., 1996; Schwartz et al., 1994; Thurston et al., 1994). The commenters agreed with EPA on the significance of these studies' results and the need to revise the PM standards, while differing with EPA's interpretation of the findings for purposes of developing the proposed PM standards.

Several commenters made reference to the conclusions of a number of international scientific panels regarding the health effects of exposure to airborne particulate matter—the British Expert Panel on Air Quality Standards, the British Committee on the Medical Effects of Air Pollutants, the World Health Organization, the Canadian Ministry of Environment, Lands and Parks, and the Health Council of the Netherlands -- and argued that all these panels found that PM concentrations equivalent to the current U.S. standards for PM<sub>10</sub> are not protective of human health and made recommendations for greater protection. One commenter noted that the findings of the British Health Panel have resulted in a British

<sup>8</sup> As discussed more fully below in this unit, epidemiological studies alone cannot be used to demonstrate mechanisms of action, but they can provide evidence useful in making inferences with regard to causal relationships (U.S. EPA, 1996b, p. V-9).

<sup>9</sup> As noted in the proposal, the kinds of effects observed in the epidemiological studies are logically related. For example, the association of PM with mortality is mainly linked to respiratory and cardiovascular causes, which is coherent with observed PM associations with respiratory and cardiovascular hospital admissions and respiratory symptoms. Further, similar categories of effects are seen in long- and short-term exposure studies.

# EXHIBIT 2



## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Parts 50, 51, 52, 53 and 58

[EPA-HQ-OAR-2007-0492; FRL-9761-8]

RIN 2060-AO47

### National Ambient Air Quality Standards for Particulate Matter

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** Based on its review of the air quality criteria and the national ambient air quality standards (NAAQS) for particulate matter (PM), the EPA is making revisions to the suite of standards for PM to provide requisite protection of public health and welfare and to make corresponding revisions to the data handling conventions for PM and to the ambient air monitoring, reporting, and network design requirements. The EPA also is making revisions to the prevention of significant deterioration (PSD) permitting program with respect to the NAAQS revisions.

With regard to primary (health-based) standards for fine particles (generally referring to particles less than or equal to 2.5 micrometers ( $\mu\text{m}$ ) in diameter,  $\text{PM}_{2.5}$ ), the EPA is revising the annual  $\text{PM}_{2.5}$  standard by lowering the level to 12.0 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) so as to provide increased protection against health effects associated with long- and short-term exposures (including premature mortality, increased hospital admissions and emergency department visits, and development of chronic respiratory disease), and to retain the 24-hour  $\text{PM}_{2.5}$  standard at a level of 35  $\mu\text{g}/\text{m}^3$ . The EPA is revising the Air Quality Index (AQI) for  $\text{PM}_{2.5}$  to be consistent with the revised primary  $\text{PM}_{2.5}$  standards. With regard to the primary standard for particles generally less than or equal to 10  $\mu\text{m}$  in diameter ( $\text{PM}_{10}$ ), the EPA is retaining the current 24-hour  $\text{PM}_{10}$  standard to continue to provide protection against effects associated with short-term exposure to thoracic coarse particles (i.e.,  $\text{PM}_{10-2.5}$ ). With regard to the secondary (welfare-based) PM standards, the EPA is generally retaining the current suite of secondary standards (i.e., 24-hour and annual  $\text{PM}_{2.5}$  standards and a 24-hour  $\text{PM}_{10}$  standard). Non-visibility welfare effects are addressed by this suite of secondary standards, and PM-related visibility impairment is addressed by the secondary 24-hour  $\text{PM}_{2.5}$  standard.

**DATES:** The final rule is effective on March 18, 2013.

**ADDRESSES:** Section X.B requests comments on an information collection request regarding changes to the monitoring requirements. Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2007-0492, to the EPA by one of the following methods:

- *www.regulations.gov*: Follow the on-line instructions for submitting comments.
- *Email*: [a-and-r-Docket@epa.gov](mailto:a-and-r-Docket@epa.gov).
- *Fax*: 202-566-9744.
- *Mail*: Docket No. EPA-HQ-OAR-2007-0492, Environmental Protection Agency, Mail code 6102T, 1200 Pennsylvania Ave. NW., Washington, DC 20460. Please include a total of two copies.
- *Hand Delivery*: Docket No. EPA-HQ-OAR-2007-0492, Environmental Protection Agency, EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

**Instructions:** Direct your comments to Docket ID No. EPA-HQ-OAR-2007-0492. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *www.regulations.gov*, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *www.regulations.gov* or email. The *www.regulations.gov* Web site is an "anonymous access" system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *www.regulations.gov* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage

at <http://www.epa.gov/epahome/dockets.htm>. Comments on this information collection request should also be sent to the Office of Management and Budget (OMB). See section X.B below for additional information regarding submitting comments to OMB.

**Docket:** The EPA has established a docket for this action under Docket No. EPA-HQ-OAR-2007-0492. All documents in the docket are listed on the *www.regulations.gov* Web site. This includes documents in the rulemaking docket (Docket ID No. EPA-HQ-OAR-2007-0492) and a separate docket, established for 2009 Integrated Science Assessment (Docket No. EPA-HQ-ORD-2007-0517), that has have been incorporated by reference into the rulemaking docket. All documents in these dockets are listed on the *www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and may be viewed, with prior arrangement, at the EPA Docket Center. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the Air and Radiation Docket and Information Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744 and the telephone number for the Air and Radiation Docket and Information Center is (202) 566-1742. For additional information about EPA's public docket visit the EPA Docket Center homepage at: <http://www.epa.gov/epahome/dockets.htm>.

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### SUPPLEMENTARY INFORMATION:

#### General Information

##### Availability of Related Information

A number of the documents that are relevant to this rulemaking are available through the EPA's Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN) Web site at [http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_index.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html).



- a. Revoking Use of Population-Oriented as a Condition for Comparability of PM<sub>2.5</sub> Monitoring Sites to the NAAQS
- b. Applicability of Micro- and Middle-scale Monitoring Sites to the Annual PM<sub>2.5</sub> NAAQS
- 3. Changes to Monitoring for the National Ambient Air Monitoring System
  - a. Background
  - b. Primary PM<sub>2.5</sub> NAAQS
  - i. Addition of a Near-road Component to the PM<sub>2.5</sub> Monitoring Network
  - ii. Use of PM<sub>2.5</sub> Continuous FEMs at SLAMS
  - c. Revoking PM<sub>10-2.5</sub> Speciation Requirements at NCore Sites
  - d. Measurements for the Proposed New PM<sub>2.5</sub> Visibility Index NAAQS
- 4. Revisions to the Quality Assurance Requirements for SLAMS, SPMs, and PSD
  - a. Quality Assurance Weight of Evidence
  - b. Quality Assurance Requirements for the Chemical Speciation Network
  - c. Waivers for Maximum Allowable Separation of Collocated PM<sub>2.5</sub> Samplers and Monitors
- 5. Revisions To Probe and Monitoring Path Siting Criteria
  - a. Near-road Component to the PM<sub>2.5</sub> Monitoring Network
  - b. CSN Network
  - c. Reinsertion of Table E-1 to Appendix E
- 6. Additional Ambient Air Monitoring Topics
  - a. Annual Monitoring Network Plans and Periodic Assessment
  - b. Operating Schedules
  - c. Data Reporting and Certification for CSN and IMPROVE Data
  - d. Requirements for Archiving Filters
- IX. Clean Air Act Implementation Requirements for the PM NAAQS
  - A. Designation of Areas
    - 1. Overview of Clean Air Act Designations Requirements
    - 2. Proposed Designations Schedules
    - 3. Comments and Responses
    - 4. Final Intended Designations Schedules
  - B. Section 110(a)(2) Infrastructure SIP Requirements
  - C. Implementing the Revised Primary Annual PM<sub>2.5</sub> NAAQS in Nonattainment Areas
  - D. Prevention of Significant Deterioration and Nonattainment New Source Review Programs for the Revised Primary Annual PM<sub>2.5</sub> NAAQS
    - 1. Prevention of Significant Deterioration
      - a. Transition Provision (Grandfathering)
        - i. Proposal
        - ii. Comments and Responses
        - iii. Final Action
      - b. Modeling Tools and Guidance Applicable to the Revised Primary Annual PM<sub>2.5</sub> NAAQS
    - c. PSD Screening Tools: Significant Emissions Rates, Significant Impact Levels, and Significant Monitoring Concentration
    - d. PSD Increments
    - e. Other PSD Transition Issues
  - 2. Nonattainment New Source Review
  - E. Transportation Conformity Program
  - F. General Conformity Program
- X. Statutory and Executive Order Reviews

- A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review
  - B. Paperwork Reduction Act
  - C. Regulatory Flexibility Act
  - D. Unfunded Mandates Reform Act
  - E. Executive Order 13132: Federalism
  - F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments
  - G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks
  - H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or Use
  - I. National Technology Transfer and Advancement Act
  - J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations
  - K. Congressional Review Act
- References

## I. Executive Summary

### A. Purpose of This Regulatory Action

Sections 108 and 109 of the Clean Air Act (CAA) govern the establishment, review, and revision, as appropriate, of the national ambient air quality standards (NAAQS) to protect public health and welfare. The CAA requires periodic review of the air quality criteria—the science upon which the standards are based—and the standards themselves. This rulemaking is being done pursuant to these statutory requirements. The schedule for completing this review is established by a court order.

In 2006, the EPA completed its last review of the PM NAAQS. In that review, the EPA took three principal actions: (1) With regard to fine particles (generally referring to particles less than or equal to 2.5 micrometers (μm) in diameter, PM<sub>2.5</sub>), at that time, the EPA revised the level of the primary 24-hour PM<sub>2.5</sub> standard from 65 to 35 μg/m<sup>3</sup> and retained the level of the primary annual PM<sub>2.5</sub> standard; (2) With regard to the primary standards for particles less than or equal to 10 μm in diameter (PM<sub>10</sub>), the EPA retained the primary 24-hour PM<sub>10</sub> standard to continue to provide protection against effects associated with short-term exposure to thoracic coarse particles (i.e., PM<sub>10-2.5</sub>) and revoked the primary annual PM<sub>10</sub> standard; and (3) the EPA also revised the secondary standards to be identical in all respects to the primary standards.

In subsequent litigation, the U.S. Court of Appeals for the District of Columbia Circuit remanded the primary annual PM<sub>2.5</sub> standard to the EPA because the Agency had failed to explain adequately why the standard provided the requisite protection from

both short- and long-term exposures to fine particles, including protection for at-risk populations such as children. The court remanded the secondary PM<sub>2.5</sub> standards to the EPA because the Agency failed to explain adequately why setting the secondary standards identical to the primary standards provided the required protection for public welfare, including protection from PM-related visibility impairment.

The EPA initiated this review in June 2007. Between 2007 and 2011, the EPA prepared draft and final Integrated Science Assessments, Risk and Exposure Assessments, and Policy Assessments. Multiple drafts of all of these documents were subject to review by the public and were peer reviewed by the EPA's Clean Air Scientific Advisory Committee (CASAC). The EPA proposed revisions to the primary and secondary PM NAAQS on June 29, 2012 (77 FR 38890). This final rulemaking is the final step in the review process.

In this rulemaking, the EPA is revising the suite of standards for PM to provide requisite protection of public health and welfare. The EPA is revising the PSD permitting regulations to address the changes in the PM NAAQS. In addition, the EPA is updating the AQI for PM<sub>2.5</sub> and making changes in the data handling conventions for PM and ambient air monitoring, reporting, and network design requirements to correspond with the changes to the PM NAAQS.

### B. Summary of Major Provisions

With regard to the primary standards for fine particles, the EPA is revising the annual PM<sub>2.5</sub> standard by lowering the level from 15.0 to 12.0 μg/m<sup>3</sup> so as to provide increased protection against health effects associated with long- and short-term exposures. The EPA is retaining the level (35 μg/m<sup>3</sup>) and the form (98th percentile) of the 24-hour PM<sub>2.5</sub> standard to continue to provide supplemental protection against health effects associated with short-term exposures. This action provides increased protection for children, older adults, persons with pre-existing heart and lung disease, and other at-risk populations against an array of PM<sub>2.5</sub>-related adverse health effects that include premature mortality, increased hospital admissions and emergency department visits, and development of chronic respiratory disease. The EPA also is eliminating spatial averaging provisions as part of the form of the annual standard to avoid potential disproportionate impacts on at-risk populations.

The final decisions for the primary annual and 24-hour PM<sub>2.5</sub> standards are

within the ranges that CASAC advised the Agency to consider. These decisions are based on an integrative assessment of an extensive body of new scientific evidence, which substantially strengthens what was known about PM<sub>2.5</sub>-related health effects in the last review, including extended analyses of key epidemiological studies, and evidence of health effects observed at lower ambient PM<sub>2.5</sub> concentrations, including effects in areas that likely met the current standards. The revised suite of PM<sub>2.5</sub> standards also reflects consideration of a quantitative risk assessment that estimates public health risks likely to remain upon just meeting the current and various alternative standards. Based on this information, the Administrator concludes that the current primary PM<sub>2.5</sub> standards are not requisite to protect public health with an adequate margin of safety, as required by the CAA, and that these revisions are warranted to provide the appropriate degree of increased public health protection.

With regard to the primary standard for thoracic coarse particles (PM<sub>10-2.5</sub>), the EPA is retaining the current 24-hour PM<sub>10</sub> standard, with a level of 150 µg/m<sup>3</sup> and a one-expected exceedance form, to continue to provide protection against effects associated with short-term exposure to PM<sub>10-2.5</sub> including premature mortality and increased hospital admissions and emergency department visits. In reaching this decision, the Administrator concludes that the available health evidence and air quality information for PM<sub>10-2.5</sub>, taken together with the considerable uncertainties and limitations associated with that information, suggests that a standard is needed to protect against short-term exposure to all types of PM<sub>10-2.5</sub> and that the degree of public health protection provided against short-term exposures to PM<sub>10-2.5</sub> does not need to be increased beyond that provided by the current PM<sub>10</sub> standard.

With regard to the secondary PM standards, the Administrator is retaining the current suite of secondary PM standards, except for a change to the form of the annual PM<sub>2.5</sub> standard. Specifically, the EPA is retaining the current secondary 24-hour PM<sub>2.5</sub> and PM<sub>10</sub> standards, and is revising only the form of the secondary annual PM<sub>2.5</sub> standard to remove the option for spatial averaging consistent with this change to the primary annual PM<sub>2.5</sub> standard. This suite of secondary standards addresses PM-related non-visibility welfare effects including ecological effects, effects on materials, and climate impacts. With respect to PM-related visibility impairment, the

Administrator has identified a target degree of protection, defined in terms of a PM<sub>2.5</sub> visibility index (based on speciated PM<sub>2.5</sub> mass concentrations and relative humidity data to calculate PM<sub>2.5</sub> light extinction), a 24-hour averaging time, and a 90th percentile form, averaged over 3 years, and a level of 30 deciviews (dv), which she judges to be requisite to protect public welfare with regard to visual air quality (VAQ). The EPA's analysis of monitoring data provides the basis for concluding that the current secondary 24-hour PM<sub>2.5</sub> standard would provide sufficient protection, and in some areas greater protection, relative to this target protection level. Adding a distinct secondary standard to address visibility would not affect this protection. Since sufficient protection from visibility impairment will be provided for all areas of the country without adoption of a distinct secondary standard, and adoption of a distinct secondary standard will not change the degree of over-protection of VAQ provided for some areas of the country by the secondary 24-hour PM<sub>2.5</sub> standard, the Administrator judges that adoption of a distinct secondary standard, in addition to the current suite of secondary standards, is not needed to provide requisite protection for both visibility and non-visibility related welfare effects.

The revisions to the PM NAAQS trigger a process under which states (and tribes, if they choose) will make recommendations to the Administrator regarding designations, identifying areas of the country that either meet or do not meet the revised NAAQS. States will also review, modify and supplement their existing state implementation plans (SIPs), as needed. With regard to these implementation-related activities, the EPA intends to promulgate a separate implementation rule on a schedule that provides timely clarity to the states, tribes, and other parties responsible for NAAQS implementation. The NAAQS revisions also affect the applicable air permitting requirement, but cause no significant change to the transportation conformity and general conformity processes. The EPA is revising its PSD regulations to provide limited grandfathering from the requirements that result from the revised PM NAAQS.

On other topics, the EPA is changing the AQI for PM<sub>2.5</sub> to be consistent with the revised primary PM<sub>2.5</sub> NAAQS. The EPA also is revising the data handling procedures for PM<sub>2.5</sub> consistent with the revised PM<sub>2.5</sub> NAAQS including the computations necessary for determining when the standards are met and the

measurement data that are appropriate for comparison to the standards. With regard to monitoring-related activities, the EPA is updating several aspects of the monitoring regulations and specifically requiring that a small number of PM<sub>2.5</sub> monitors be relocated to be collocated with measurements of other pollutants (e.g., nitrogen dioxide, carbon monoxide) in the near-road environment.

### C. Costs and Benefits

In setting the NAAQS, the EPA may not consider the costs of implementing the standards. This was confirmed by the United States Supreme Court in *Whitman v. American Trucking Associations*, 531 U.S. 457, 465–472, 475–76 (2001), as noted in section II.A of this rule. As has traditionally been done in NAAQS rulemaking, the EPA has conducted a Regulatory Impact Analysis (RIA) to provide the public with information on the potential costs and benefits of attaining several alternative PM<sub>2.5</sub> standards. In NAAQS rulemaking, the RIA is done for informational purposes only, and the final decisions on the NAAQS in this rulemaking are not in any way based on consideration of the information or analyses in the RIA. The RIA fulfills the requirements of Executive Orders 13563 and 12866. The summary of the RIA, which is discussed in more detail below in section X.A, estimates benefits ranging from \$4,000 million to \$9,100 million at a 3 percent discount rate and \$3,600 million to \$8,200 million at a 7 percent discount rate in 2020 and costs ranging from \$53 million to \$350 million per year at a 7 percent discount rate.

## II. Background

### A. Legislative Requirements

Two sections of the CAA govern the establishment, review and revision of the NAAQS. Section 108 (42 U.S.C. 7408) directs the Administrator to identify and list certain air pollutants and then to issue air quality criteria for those pollutants. The Administrator is to list those air pollutants that in her “judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare;” “the presence of which in the ambient air results from numerous or diverse mobile or stationary sources;” and “for which \* \* \* [the Administrator] plans to issue air quality criteria \* \* \*” Air quality criteria are intended to “accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or

understanding of both evidence-based and risk-based considerations to inform two overarching questions related to: (1) The adequacy of the current suite of PM<sub>2.5</sub> standards and (2) revisions to the standards that were appropriate to consider in this review to protect against health effects associated with both long- and short-term exposures to fine particles. When evaluating the health protection afforded by the current or any alternative suites of standards considered, the Policy Assessment took into account the four basic elements of the NAAQS: The indicator, averaging time, form, and level.

The general approach for reviewing the primary PM<sub>2.5</sub> standards described above provided a comprehensive basis that helped to inform the Administrator's judgments in reaching her proposed and final decisions to revise the current suite of primary fine particle NAAQS and in responding to the remand of the 2006 primary annual PM<sub>2.5</sub> standard.

#### B. Overview of Health Effects Evidence

This section outlines the key information presented in section III.B of the proposal (77 FR 38906 to 38911, June 29, 2012) and discussed more fully in the Integrated Science Assessment (Chapters 2, 4, 5, 6, 7, and 8) and the Policy Assessment (Chapter 2) related to health effects associated with fine particle exposures. Section III.B. of the proposal discusses available information on the health effects associated with exposures to PM<sub>2.5</sub>, including the nature of such health effects (section III.B.1) and associated limitations and uncertainties (section III.B.2), at-risk populations (section III.B.3), and potential PM<sub>2.5</sub>-related impacts on public health (section III.B.4). As was true in the last two reviews, evidence from epidemiological, controlled human exposure and animal toxicological studies played a key role in the Integrated Science Assessment's evaluation of the scientific evidence.

The 2006 PM NAAQS review concluded that there was "strong epidemiological evidence" for linking long-term PM<sub>2.5</sub> exposures with cardiovascular-related and lung cancer mortality and respiratory-related morbidity and for linking short-term PM<sub>2.5</sub> exposures with cardiovascular-related and respiratory-related mortality and morbidity (U.S. EPA, 2004, p. 9–46; U.S. EPA, 2005, p. 5–4). Overall, the evidence from epidemiological, toxicological, and controlled human exposure studies supported "likely causal associations" between PM<sub>2.5</sub> and both mortality and morbidity from

cardiovascular and respiratory diseases, based on "an assessment of strength, robustness, and consistency in results" (U.S. EPA, 2004, p. 9–48).<sup>26</sup>

In this review, based on the expanded body of evidence, the EPA finds that:

(1) In looking across the extensive new scientific evidence available in this review, our overall understanding of health effects associated with fine particle exposures has been greatly expanded. The currently available evidence is largely consistent with evidence available in the last review and substantially strengthens what is known about the effects associated with fine particle exposures.

(2) A number of large multi-city epidemiological studies have been conducted throughout the U.S., including extended analyses of long-term exposure studies that were important to inform decision-making in the last review. The body of currently available scientific evidence has also been expanded greatly by the publication of a number of new multi-city, time-series studies that have used uniform methodologies to investigate the effects of short-term PM<sub>2.5</sub> exposures on public health. This body of evidence provides a more expansive data base and considers multiple locations representing varying regions and seasons that provide evidence of the influence of different air pollution mixes on PM<sub>2.5</sub>-associated health effects. These studies provide more precise estimates of the magnitude of effects associated with short-term PM<sub>2.5</sub> exposure than most smaller-scale single-city studies that were more commonly available in the last review. These studies have reported consistent increases in morbidity and/or premature mortality related to ambient PM<sub>2.5</sub> concentrations, with the strongest evidence reported for cardiovascular-related effects.

(3) In addition, the findings of new toxicological and controlled human exposure studies greatly expand and provide stronger support for a number of potential biological mechanisms or pathways for cardiovascular and respiratory effects associated with long- and short-term PM exposures. These studies provide coherence and biological plausibility for the effects observed in epidemiological studies.

(4) Using a more formal framework for reaching causal determinations than used in prior reviews,<sup>27</sup> the EPA concludes that a

causal relationship exists between both long- and short-term exposures to PM<sub>2.5</sub> and premature mortality and cardiovascular effects and a likely causal relationship exists between long- and short-term PM<sub>2.5</sub> exposures and respiratory effects. Further, there is evidence suggestive of a causal relationship between long-term PM<sub>2.5</sub> exposures and other health effects, including developmental and reproductive effects (e.g., low birth weight, infant mortality) and carcinogenic, mutagenic, and genotoxic effects (e.g., lung cancer mortality).<sup>28</sup>

(5) The newly available evidence significantly strengthens the link between long- and short-term exposure to PM<sub>2.5</sub> and premature mortality, while providing indications that the magnitude of the PM<sub>2.5</sub>-mortality association with long-term exposures may be larger than previously estimated. The strongest evidence comes from recent studies investigating long-term exposure to PM<sub>2.5</sub> and cardiovascular-related mortality. The evidence supporting a causal relationship between long-term PM<sub>2.5</sub> exposure and mortality also includes consideration of new studies that demonstrated an improvement in community health following reductions in ambient fine particles.

(6) Several new studies have examined the association between cardiovascular effects and long-term PM<sub>2.5</sub> exposures in multi-city studies conducted in the U.S. and Europe. While studies were not available in the last review with regard to long-term exposure and cardiovascular-related morbidity, recent studies have provided new evidence linking long-term exposure to PM<sub>2.5</sub> with an array of cardiovascular effects such as heart attacks, congestive heart failure, stroke, and mortality. This evidence is coherent with studies of short-term exposure to PM<sub>2.5</sub> that have observed associations with a continuum of effects ranging from subtle changes in indicators of cardiovascular health to serious clinical events, such as increased hospitalizations and emergency department visits due to cardiovascular disease and cardiovascular mortality.

(7) Extended analyses of studies available in the last review as well as new epidemiological studies conducted in the U.S. and abroad provide stronger evidence of respiratory-related morbidity effects associated with long-term PM<sub>2.5</sub> exposure. The strongest evidence for respiratory-related

<sup>26</sup> The term "likely causal association" was used in the 2004 Criteria Document to summarize the strength of the available evidence available in the last review for PM<sub>2.5</sub>. However, this terminology was not based on a formal framework for evaluating evidence for inferring causation. Since the last review, the EPA has developed a more formal framework for reaching causal determinations with standardized language to express evaluation of the evidence (U.S. EPA, 2009a, section 1.5).

<sup>27</sup> The causal framework draws upon the assessment and integration of evidence from across epidemiological, controlled human exposure, and toxicological studies, and the related uncertainties that ultimately influence our understanding of the evidence. This framework employs a five-level hierarchy that classifies the overall weight of evidence and causality using the following categorizations: causal relationship, likely to be causal relationship, suggestive of a causal

relationship, inadequate to infer a causal relationship, and not likely to be a causal relationship (U.S. EPA, 2009a, Table 1–3). The development of the causal framework reflects considerable input from CASAC and the public, with CASAC concluding that, "The five-level classification of strength of evidence for causal inference has been systemically applied [for PM]; this approach has provided transparency and a clear statement of the level of confidence with regard to causation, and we recommend its continued use in future ISAs" (Samet, 2009f, p. 1).

<sup>28</sup> These causal inferences are based not only on the more expansive epidemiological evidence available in this review but also reflect consideration of important progress that has been made to advance our understanding of a number of potential biologic modes of action or pathways for PM-related cardiovascular and respiratory effects (U.S. EPA, 2009a, chapter 5).



effects is from studies that evaluated decrements in lung function growth, increased respiratory symptoms, and asthma development. The strongest evidence from short-term PM<sub>2.5</sub> exposure studies has been observed for increased respiratory-related emergency department visits and hospital admissions for chronic obstructive pulmonary disease (COPD) and respiratory infections.

(8) The body of scientific evidence is somewhat expanded from the 2006 review but is still limited with respect to associations between long-term PM<sub>2.5</sub> exposures and developmental and reproductive effects as well as cancer, mutagenic, and genotoxic effects. The strongest evidence for an association between PM<sub>2.5</sub> and developmental and reproductive effects comes from epidemiological studies of low birth weight and infant mortality, especially due to respiratory causes during the post-neonatal period (i.e., 1 month–12 months of age). With regard to cancer effects, “[m]ultiple epidemiologic studies have shown a consistent positive association between PM<sub>2.5</sub> and lung cancer mortality, but studies have generally not reported associations between PM<sub>2.5</sub> and lung cancer incidence” (U.S. EPA 2009a p. 2–13).

(9) Efforts to evaluate the relationships between PM composition and health effects continue to evolve. While many constituents of PM<sub>2.5</sub> can be linked with differing health effects, the evidence is not yet sufficient to allow differentiation of those constituents or sources that may be more closely related to specific health outcomes nor to exclude any individual component or group of components associated with any source categories from the fine particle mixture of concern.

(10) Specific groups within the general population are at increased risk for experiencing adverse health effects related to PM exposures. The currently available evidence expands our understanding of previously identified at-risk populations (i.e., children, older adults, and individuals with pre-existing heart and lung disease) and supports the identification of additional at-risk populations (e.g., persons with lower socioeconomic status, genetic differences). Evidence for PM-related effects in these at-risk populations has expanded and is stronger than previously observed. There is emerging, though still limited, evidence for additional potentially at-risk populations, such as those with diabetes, people who are obese, pregnant women, and the developing fetus.

(11) The population potentially affected by PM<sub>2.5</sub> is large. In addition, large subgroups of the U.S. population have been identified as at-risk populations. While individual effect estimates from epidemiological studies may be small in size, the public health impact of the mortality and morbidity associations can be quite large given the extent of exposure. Taken together, this suggests that exposure to ambient PM<sub>2.5</sub> concentrations can have substantial public health impacts.

(12) While the currently available scientific evidence is stronger and more consistent than in previous reviews, providing a strong basis for decision making in this review, the

EPA recognizes that important uncertainties and limitations in the health effects evidence remain. Epidemiological studies evaluating health effects associated with long- and short-term PM<sub>2.5</sub> exposures have reported heterogeneity in responses between cities and geographic regions within the U.S. This heterogeneity may be attributed, in part, to differences in the fine particle composition or related to exposure measurement error, which can introduce bias and increased uncertainty in associated health effect estimates. Variability in the associations observed across PM<sub>2.5</sub> epidemiological studies may be due in part to exposure error related to measurement-related issues, the use of central fixed-site monitors to represent population exposure to PM<sub>2.5</sub>, models used in lieu of or to supplement ambient measurements, and our limited understanding of factors that may influence exposures (e.g., topography, the built environment, weather, source characteristics, ventilation usage, personal activity patterns, photochemistry). In addition, where PM<sub>2.5</sub> and other pollutants (e.g., ozone, nitrogen dioxide, and carbon monoxide) are correlated, it can be difficult to distinguish the effects of the various pollutants in the ambient mixture (i.e., co-pollutant confounding).<sup>29</sup>

While uncertainties and limitations still remain in the available health effects evidence, the Administrator judges the currently available scientific data base to be stronger and more consistent than in previous reviews providing a strong basis for decision making in this review.

### C. Overview of Quantitative Characterization of Health Risks

In addition to a comprehensive evaluation of the health effects evidence available in this review, the EPA conducted an expanded quantitative risk assessment for selected health endpoints to provide additional information and insights to inform decisions on the primary PM<sub>2.5</sub> NAAQS.<sup>30</sup> As discussed in section III.C of the proposal, the approach used to develop quantitative risk estimates associated with PM<sub>2.5</sub> exposures was built on the approach used and lessons learned in the last review and focused on improving the characterization of the overall confidence in the risk estimates,

including related uncertainties, by incorporating a number of enhancements, in terms of both the methods and data used in the analyses.

The goals of this quantitative risk assessment were largely the same as those articulated in the risk assessment conducted for the last review. These goals included: (1) To provide estimates of the potential magnitude of premature mortality and/or selected morbidity effects in the population associated with recent ambient levels of PM<sub>2.5</sub> and with simulating just meeting the current and alternative suites of PM<sub>2.5</sub> standards in 15 selected urban study areas,<sup>31</sup> including, where data were available, consideration of impacts on at-risk populations; (2) to develop a better understanding of the influence of various inputs and assumptions on the risk estimates to more clearly differentiate among alternative suites of standards; and (3) to gain insights into the distribution of risks and patterns of risk reductions and the variability and uncertainties in those risk estimates. In addition, the quantitative risk assessment included nationwide estimates of the potential magnitude of premature mortality associated with long-term exposure to recent ambient PM<sub>2.5</sub> concentrations to more broadly characterize this risk on a national scale and to support the interpretation of the more detailed risk estimates generated for selected urban study areas.

The expanded and updated risk assessment conducted in this review included estimates of risk for: (1) All-cause, ischemic heart disease-related, cardiopulmonary-related, and lung cancer-related mortality associated with long-term PM<sub>2.5</sub> exposure; (2) non-accidental, cardiovascular-related, and respiratory-related mortality associated with short-term PM<sub>2.5</sub> exposure; and (3) cardiovascular-related and respiratory-related hospital admissions and asthma-related emergency department visits

<sup>31</sup> The Risk Assessment concluded that these 15 urban study areas were generally representative of urban areas in the U.S. likely to experience relatively elevated levels of risk related to ambient PM<sub>2.5</sub> exposure with the potential for better characterization at the higher end of that distribution (U.S. EPA, 2011a, p. 2–42; U.S. EPA, 2010a, section 4.4, Figure 4–17). The representativeness analysis also showed that the 15 urban study areas do not capture areas with the highest baseline mortality risks or the oldest populations (both of which can result in higher PM<sub>2.5</sub>-related mortality estimates). However, some of the areas with the highest values for these attributes had relatively low PM<sub>2.5</sub> concentrations (e.g., urban areas in Florida) and, consequently, the Risk Assessment concluded failure to include these areas in the set of urban study areas was unlikely to exclude high PM<sub>2.5</sub>-risk locations (U.S. EPA, 2010a, section 4.4.1).

<sup>29</sup> A copollutant meets the criteria for potential confounding in PM-health associations if: (1) It is a potential risk factor for the health effect under study; (2) it is correlated with PM; and (3) it does not act as an intermediate step in the pathway between PM exposure and the health effect under study (U.S. EPA, 2004, p. 8–10).

<sup>30</sup> The quantitative risk assessment conducted for this review is more fully described and presented in the Risk Assessment (U.S. EPA, 2010a) and summarized in detail in the Policy Assessment (U.S. EPA, 2011a, sections 2.2.2. and 2.3.4.2). The scope and methodology for this risk assessment were developed over the last few years with considerable input from CASAC and the public as described in section II.B.3 above.



department visits for asthma-related events were significant: Furthermore, most of the aggregate risk associated with short-term exposures was not primarily driven by the small number of days with PM<sub>2.5</sub> concentrations in the upper tail of the air quality distribution, but rather by the large number of days with PM<sub>2.5</sub> concentrations at and around the mean of the distribution, that is, the 24-hour average concentrations that are in the low- to mid-range, well below the peak 24-hour concentrations (U.S. EPA, 2011a, p. 2–3).

With regard to characterizing estimates of PM<sub>2.5</sub>-related risk associated with simulation of alternative standards, the Policy Assessment recognized that greater overall confidence was associated with estimates of *risk reduction* than for estimates of *absolute risk remaining* (U.S. EPA, 2011a, p. 2–94). Furthermore, the Policy Assessment recognized that estimates of absolute risk remaining for each of the alternative standard levels considered, particularly in the context of long-term exposure-related mortality, may be underestimated.<sup>35</sup> In addition, the Policy Assessment observed that in considering the overall confidence associated with the quantitative analyses, the Risk Assessment recognized that: (1) Substantial variability existed in the magnitude of risk remaining across urban study areas and (2) in general, higher confidence was associated with risk estimates based on PM<sub>2.5</sub> concentrations near the mean PM<sub>2.5</sub> concentrations in the underlying epidemiological studies providing the concentration-response functions (e.g., within one standard deviation of the mean PM<sub>2.5</sub> concentration reported). Furthermore, although the Risk Assessment estimated that the alternative 24-hour standard levels considered (when controlling) would result in additional estimated risk reductions beyond those estimated for

alternative annual standard levels alone, these additional estimated reductions were highly variable. Conversely, the Risk Assessment recognized that alternative annual standard levels, when controlling, resulted in more consistent risk reductions across urban study areas, thereby potentially providing a more consistent degree of public health protection (U.S. EPA, 2010a, p. 5–17).

#### *D. Conclusions on the Adequacy of the Current Primary PM<sub>2.5</sub> Standards*

##### *1. Introduction*

The initial issue to be addressed in the current review of the primary PM<sub>2.5</sub> standards is whether, in view of the advances in scientific knowledge and other information reflected in the Integrated Science Assessment, the Risk Assessment, and the Policy Assessment, the existing standards should be retained or revised. In considering the adequacy of the current suite of PM<sub>2.5</sub> standards, the Administrator has considered the large body of evidence presented and assessed in the Integrated Science Assessment (U.S. EPA, 2009a), the quantitative assessment of risks, staff conclusions and associated rationales presented in the Policy Assessment, views expressed by CASAC, and public comments. The Administrator has taken into account both evidence- and risk-based considerations<sup>36</sup> in developing final conclusions on the adequacy of the current primary PM<sub>2.5</sub> standards.

##### *a. Evidence- and Risk-based Considerations in the Policy Assessment*

In considering the available epidemiological evidence in this review, the Policy Assessment took a broader approach than was used in the last review. This approach reflected the more extensive and stronger body of evidence available since the last review on health effects related to both long- and short-term exposure to PM<sub>2.5</sub>. As discussed in section III.A.3 above, this broader approach focused on setting the annual standard as the “generally

controlling” standard for lowering both short- and long-term PM<sub>2.5</sub> concentrations and so providing requisite protection to public health. In conjunction with such an annual standard, this approach focused on setting the 24-hour standard to provide supplemental protection against days with high peak PM<sub>2.5</sub> concentrations.

In addressing the question whether the evidence now available in this review supports consideration of standards that are more protective than the current PM<sub>2.5</sub> standards, the Policy Assessment considered whether: (1) Statistically significant health effects associations with long- or short-term exposures to fine particles occur in areas that would likely have met the current PM<sub>2.5</sub> standards [see *American Trucking Associations*, 283 F. 3d at 369, 376 (revision of level of PM NAAQS justified when health effects are observed in areas meeting the existing standard)], and (2) associations with long-term exposures to fine particles extend down to lower air quality concentrations than had previously been observed. With regard to associations observed in long-term PM<sub>2.5</sub> exposure studies, the Policy Assessment recognized that extended follow-up analyses of the ACS and Harvard Six Cities studies provided consistent and stronger evidence of an association with mortality at lower air quality distributions than had previously been observed (U.S. EPA, 2011a, pp. 2–31 to 2–32). The original and reanalysis of the ACS study reported positive and statistically significant effects associated with a long-term mean PM<sub>2.5</sub> concentration of 18.2 µg/m<sup>3</sup> across 50 metropolitan areas for 1979 to 1983 (Pope *et al.*, 1995; Krewski *et al.*, 2000).<sup>37</sup> In extended analyses, positive and statistically significant effects of approximately similar magnitude were associated with declining PM<sub>2.5</sub> concentrations, from an aggregate long-term mean in 58 metropolitan areas of 21.2 µg/m<sup>3</sup> in the original monitoring period (1979 to 1983) to 14.0 µg/m<sup>3</sup> for 116 metropolitan areas in the most recent years evaluated (1999–2000), with an overall average across the two study periods in 51 metropolitan areas of 17.7 µg/m<sup>3</sup> (Pope *et al.*, 2002; Krewski *et al.*, 2009). With regard to the Harvard Six Cities Study, the original and reanalysis reported positive and statistically significant effects associated

<sup>35</sup> Based on the consideration of both the qualitative and quantitative assessments of uncertainty, the Risk Assessment concluded that it is unlikely that the estimated risks are over-estimated, particularly for premature mortality related to long-term PM<sub>2.5</sub> exposures. In fact, the Policy Assessment and the Risk Assessment concluded that the core risk estimates for this category of health effects may well be biased low based on consideration of alternative model specifications evaluated in the sensitivity analyses (U.S. EPA, 2011a, p. 2–41; U.S. EPA, 2010a, p. 5–16; Figures 4–7 and 4–8). In addition, the Policy Assessment recognized that the currently available scientific information included evidence for a broader range of health endpoints and at-risk populations beyond those included in the quantitative risk assessment, including decrements in lung function growth and respiratory symptoms in children as well as reproductive and developmental effects (U.S. EPA, 2011a, section 2.2.1).

<sup>36</sup> Evidence-based considerations include the assessment of epidemiological, toxicological, and controlled human exposure studies evaluating long- or short-term exposures to PM<sub>2.5</sub>, with supporting evidence related to dosimetry and potential pathways/modes of action, as well as the integration of evidence across each of these disciplines, as assessed in the Integrated Science Assessment (U.S. EPA, 2009a) and focus on the policy-relevant considerations as discussed in section III.B above and in the Policy Assessment (U.S. EPA, 2011a, section 2.2.1). Risk-based considerations draw from the results of the quantitative analyses presented in the Risk Assessment (U.S. EPA, 2010a) and focus on the policy-relevant considerations as discussed in section III.C above and in the Policy Assessment (U.S. EPA, 2011a, section 2.2.2).

<sup>37</sup> The study periods referred to in the Policy Assessment (U.S. EPA, 2011a) and in this final rule reflect the years of air quality data that were included in the analyses, whereas the study periods identified in the Integrated Science Assessment (U.S. EPA, 2009a) reflect the years of health event data that were included.

### **E. Administrator's Proposed Conclusions Concerning the Adequacy of the Current Primary PM<sub>10</sub> Standard**

In considering the evidence and information as they relate to the adequacy of the current 24-hour PM<sub>10</sub> standard, the Administrator first noted in the proposal that this standard is meant to protect the public health against effects associated with short-term exposures to PM<sub>10-2.5</sub>. In the last review, it was judged appropriate to maintain such a standard given the “growing body of evidence suggesting causal associations between short-term exposure to thoracic coarse particles and morbidity effects, such as respiratory symptoms and hospital admissions for respiratory diseases, and possibly mortality” (71 FR 61185, October 17, 2006). Given the continued expansion in the body of scientific evidence linking short-term PM<sub>10-2.5</sub> to health outcomes such as premature death and hospital visits, discussed in detail in the Integrated Science Assessment (U.S. EPA, 2009a, Chapter 6) and summarized in the proposal, the Administrator provisionally concluded that the available evidence continued to support the appropriateness of maintaining a standard to protect the public health against effects associated with short-term (e.g., 24-hour) exposures to all PM<sub>10-2.5</sub>. In drawing provisional conclusions in the proposal as to whether the current PM<sub>10</sub> standard remains requisite (i.e., neither more nor less stringent than necessary) to protect public health with an adequate margin of safety against such exposures, the Administrator considered the following:

- (1) The extent to which it is appropriate to maintain a standard that provides some measure of protection against all PM<sub>10-2.5</sub>, regardless of composition or source of origin;
- (2) The extent to which it is appropriate to retain a PM<sub>10</sub> indicator for a standard meant to protect against exposures to ambient PM<sub>10-2.5</sub>; and
- (3) The extent to which the current PM<sub>10</sub> standard provides an appropriate degree of public health protection.

With regard to the first point, the proposal noted the conclusion from the last review that dosimetric, toxicological, occupational, and epidemiological evidence supported retention of a primary standard to provide some measure of protection against short-term exposures to all thoracic coarse particles, regardless of their source of origin or location, consistent with the Act's requirement that primary NAAQS provide requisite protection with an adequate margin of safety (71 FR 61197). In that review, the EPA concluded that PM from a number of source types, including motor vehicle

emissions, coal combustion, oil burning, and vegetative burning, are associated with health effects (U.S. EPA, 2004). This information formed part of the basis for the D.C. Circuit's holding that it was appropriate for the thoracic coarse particle standard to provide “some protection from exposure to thoracic coarse particles \* \* \* in all areas” (*American Farm Bureau Federation v. EPA*, 559 F. 3d at 532–33).

In considering this issue in the proposal, the Administrator judged that the expanded body of scientific evidence in this review provides even more support for a standard that protects against exposures to all thoracic coarse particles, regardless of their location or source of origin. Specifically, the Administrator noted that epidemiological studies have reported positive associations between PM<sub>10-2.5</sub> and mortality or morbidity in a large number of cities across North America, Europe, and Asia, encompassing a variety of environments where PM<sub>10-2.5</sub> sources and composition are expected to vary widely. See 77 FR 38959. In considering this evidence, the Integrated Science Assessment concluded that “many constituents of PM can be linked with differing health effects” (U.S. EPA, 2009a, p. 2–26). While PM<sub>10-2.5</sub> in most of these study areas is of largely urban origin, the Administrator noted that some recent studies have also linked mortality and morbidity with relatively high ambient concentrations of thoracic coarse particles of non-urban crustal origin. In considering these studies, she noted the Integrated Science Assessment's conclusion that “PM (both PM<sub>2.5</sub> and PM<sub>10-2.5</sub>) from crustal, soil or road dust sources or PM tracers linked to these sources are associated with cardiovascular effects” (U.S. EPA, 2009a, p. 2–26).

In light of this body of available evidence reporting PM<sub>10-2.5</sub>-associated health effects across different locations with a variety of sources, as well as the Integrated Science Assessment's conclusions regarding the links between adverse health effects and PM sources and composition, the Administrator provisionally concluded in the proposal that it is appropriate to maintain a standard that provides some measure of protection against exposures to all thoracic coarse particles, regardless of their location, source of origin, or composition (77 FR 38959–60).

With regard to the second point, in considering the appropriateness of a PM<sub>10</sub> indicator for a standard meant to provide such public health protection, the Administrator noted that the rationale used in the last review to support the unqualified PM<sub>10</sub> indicator

(see above) remains relevant in the current review. Specifically, as an initial consideration, she noted that PM<sub>10</sub> mass includes both coarse PM (PM<sub>10-2.5</sub>) and fine PM (PM<sub>2.5</sub>). As a result, the concentration of PM<sub>10-2.5</sub> allowed by a PM<sub>10</sub> standard set at a single level declines as the concentration of PM<sub>2.5</sub> increases. At the same time, the Administrator noted that PM<sub>2.5</sub> concentrations tend to be higher in urban areas than in rural areas (U.S. EPA, 2005, p. 2–54, and Figures 2–23 and 2–24) and, therefore, a PM<sub>10</sub> standard will generally allow lower PM<sub>10-2.5</sub> concentrations in urban areas than in rural areas. 77 FR 38960.

In considering the appropriateness of this variation in allowable PM<sub>10-2.5</sub> concentrations, the Administrator considered the relative strength of the evidence for health effects associated with PM<sub>10-2.5</sub> of urban origin versus non-urban origin. She specifically noted that, as described above and similar to the scientific evidence available in the last review, the large majority of the available evidence for thoracic coarse particle health effects comes from studies conducted in locations with sources more typical of urban and industrial areas than of rural areas. Although as just noted, associations with adverse health effects have been reported in some study locations where PM<sub>10-2.5</sub> is largely non-urban in origin (i.e., in dust storm studies), particle concentrations in these study areas are typically much higher than reported in study locations where the PM<sub>10-2.5</sub> is of urban origin. Therefore, the Administrator noted that the strongest evidence for a link between PM<sub>10-2.5</sub> and adverse health impacts, particularly for such a link at relatively low particle concentrations, comes from studies where exposure is to PM<sub>10-2.5</sub> of urban or industrial origin. 77 FR 38960.

The Administrator also noted that chemical constituents present at higher levels in urban or industrial areas, including byproducts of incomplete combustion (e.g. polycyclic aromatic hydrocarbons) emitted as PM<sub>2.5</sub> from motor vehicles as well as metals and other contaminants emitted from anthropogenic sources, can contaminate PM<sub>10-2.5</sub> (U.S. EPA, 2004, p. 8–344; 71 FR 2665). While the Administrator acknowledged the uncertainty expressed in the Integrated Science Assessment regarding the extent to which, based on available evidence, particle composition can be linked to health outcomes, she also considered the possibility that PM<sub>10-2.5</sub> contaminants typical of urban or industrial areas could increase the

evidence, as reflected in the weight of evidence conclusions in the Integrated Science Assessment and as discussed in the proposal, the Administrator judges that it is appropriate to consider and account for them when drawing conclusions about the implications of individual PM<sub>10-2.5</sub> health studies for the current standard. Commenters have not provided new information that would change the Administrator's views on the evidence and uncertainties.

In recommending that the PM<sub>10</sub> standard be revised, some commenters supported their conclusions by referencing studies that evaluated PM<sub>10</sub>, rather than PM<sub>10-2.5</sub>. These commenters contended that "[t]he most relevant studies to the setting of a PM<sub>10</sub> standard are the thousands of studies that have reported adverse effects associated with PM<sub>10</sub> pollution" (ALA *et al.*, 2012).

As discussed in the Policy Assessment, the proposal, and above, since the establishment of the primary PM<sub>2.5</sub> standards, the purpose of the primary PM<sub>10</sub> standard has been to protect against health effects associated with exposures to PM<sub>10-2.5</sub>. PM<sub>10</sub> is the indicator, not the target pollutant. With regard to the appropriateness of considering PM<sub>10</sub> health studies for the purpose of reaching conclusions on a standard meant to protect against exposures to PM<sub>10-2.5</sub>, the proposal noted that PM<sub>10</sub> includes both fine and coarse particles, even in locations with the highest concentrations of PM<sub>10-2.5</sub>. Therefore, the extent to which PM<sub>10</sub> effect estimates reflect associations with PM<sub>10-2.5</sub> versus PM<sub>2.5</sub> can be highly uncertain and it is often unclear how PM<sub>10</sub> health studies should be interpreted when considering a standard meant to protect against exposures to PM<sub>10-2.5</sub>. Given this uncertainty and the availability of a number of PM<sub>10-2.5</sub> health studies in this review, the Integrated Science Assessment considered PM<sub>10-2.5</sub> studies, but not PM<sub>10</sub> studies, when drawing weight-of-evidence conclusions regarding the coarse fraction.<sup>130</sup> In light of the uncertainty in ascribing PM<sub>10</sub>-related health effects to the coarse or fine fractions, indicating that the best evidence for effects associated with exposures to PM<sub>10-2.5</sub> comes from studies evaluating PM<sub>10-2.5</sub> itself, and

given CASAC's support for the approach adopted in the Integrated Science Assessment, which draws weight-of-evidence conclusions for PM<sub>2.5</sub> and PM<sub>10-2.5</sub> but not for PM<sub>10</sub> (Samet, 2009f), the EPA continues to conclude that it is appropriate to focus on PM<sub>10-2.5</sub> health studies when considering the degree of public health protection provided by the current primary PM<sub>10</sub> standard, a standard intended exclusively to provide protection against exposures to PM<sub>10-2.5</sub>.

#### **G. Administrator's Final Decision on the Primary PM<sub>10</sub> Standard**

In reaching a final decision on the primary PM<sub>10</sub> standard, the Administrator takes into account the available scientific evidence, and the assessment of that evidence, in the Integrated Science Assessment; the analyses and staff conclusions presented in the Policy Assessment; the advice and recommendations of CASAC; and public comments on the proposal. In particular, as in the proposal, the Administrator places emphasis on her consideration of the following issues:

- (1) The extent to which it is appropriate to maintain a standard that provides some measure of protection against all PM<sub>10-2.5</sub>, regardless of composition or source of origin;
- (2) The extent to which it is appropriate to retain a PM<sub>10</sub> indicator for a standard meant to protect against exposures to ambient PM<sub>10-2.5</sub>; and
- (3) The extent to which the current PM<sub>10</sub> standard provides an appropriate degree of public health protection.

Each of these issues is discussed below.

With regard to the first issue, as in the proposal the Administrator judges that the expanded body of scientific evidence available in this review provides ample support for a standard that protects against exposures to all thoracic coarse particles, regardless of their location or source of origin. There was already ample evidence for this position in the previous review,<sup>131</sup> and that evidence has since increased.

Specifically, the Administrator notes that epidemiological studies have reported positive associations between PM<sub>10-2.5</sub> and mortality or morbidity in a large number of cities across North America, Europe, and Asia, encompassing a variety of environments where PM<sub>10-2.5</sub> sources and composition are expected to vary widely. In considering this evidence, the Integrated Science Assessment concludes that "many constituents of PM can be linked with differing health effects" (U.S. EPA,

2009a, p. 2–26). Although PM<sub>10-2.5</sub> in most of these study areas is of largely urban origin, the Administrator notes that some recent studies have also linked mortality and morbidity with relatively high ambient concentrations of particles of non-urban crustal origin. In considering these studies, she notes the Integrated Science Assessment's conclusion that "PM (both PM<sub>2.5</sub> and PM<sub>10-2.5</sub>) from crustal, soil or road dust sources or PM tracers linked to these sources are associated with cardiovascular effects" (U.S. EPA, 2009a, p. 2–26). The Administrator likewise notes CASAC's emphatic advice that a standard remains needed for all types of thoracic coarse PM.<sup>132</sup> In light of this body of available evidence reporting PM<sub>10-2.5</sub>-associated health effects across different locations with a variety of sources, the Integrated Science Assessment's conclusions regarding the links between adverse health effects and PM sources and composition, and CASAC's advice, the Administrator concludes in the current review that it is appropriate to maintain a standard that provides some measure of protection against exposures to all thoracic coarse particles, regardless of their location, source of origin, or composition.

With regard to the second issue, in considering the appropriateness of a PM<sub>10</sub> indicator for a standard meant to provide such public health protection, the Administrator notes that the rationale used in the last review to support the unqualified PM<sub>10</sub> indicator remains relevant in the current review. Specifically, as an initial consideration, she notes that PM<sub>10</sub> mass includes both coarse PM (PM<sub>10-2.5</sub>) and fine PM (PM<sub>2.5</sub>). As a result, the concentration of PM<sub>10-2.5</sub> allowed by a PM<sub>10</sub> standard set at a single level declines as the concentration of PM<sub>2.5</sub> increases. At the same time, the Administrator notes that PM<sub>2.5</sub> concentrations tend to be higher in urban areas than rural areas (U.S. EPA, 2005, p. 2–54, and Figures 2–23 and 2–24) and, therefore, a PM<sub>10</sub> standard will generally allow lower PM<sub>10-2.5</sub> concentrations in urban areas than in rural areas.

In considering the appropriateness of this variation in allowable PM<sub>10-2.5</sub> concentrations, the Administrator considers the relative strength of the evidence for health effects associated with PM<sub>10-2.5</sub> of urban origin versus non-urban origin. She specifically notes that, as discussed in the proposal, the large majority of the available evidence for

<sup>130</sup> Although EPA relied in the 1997 review on evidence from PM<sub>10</sub> studies, EPA did so out of necessity (i.e., there were as yet no reliable studies measuring PM<sub>10-2.5</sub>). In the 2006 review, EPA placed primary reliance on epidemiologic studies measuring or estimating PM<sub>10-2.5</sub>, although there were comparatively few such studies. In this review, a larger body of PM<sub>10-2.5</sub> studies are available. EPA regards these studies as the evidence to be given principal weight in reviewing the adequacy of the PM<sub>10</sub> standard.

<sup>131</sup> The D.C. Circuit agreed. See 559 F. 3d at 532–33.

<sup>132</sup> Indeed, CASAC recommended making the standard for all types of thoracic coarse PM more stringent (Samet, 2010d).



thoracic coarse particle health effects comes from studies conducted in locations with sources more typical of urban and industrial areas than rural areas. While associations with adverse health effects have been reported in some study locations where PM<sub>10-2.5</sub> is largely non-urban in origin (i.e., in dust storm studies), particle concentrations in these study areas are typically much higher than reported in study locations where the PM is of urban origin. Therefore, the Administrator notes that the strongest evidence for a link between PM<sub>10-2.5</sub> and adverse health impacts, particularly for such a link at relatively low particle concentrations, comes from studies of urban or industrial PM<sub>10-2.5</sub>.

The Administrator also notes that chemical constituents present at higher levels in urban or industrial areas, including byproducts of incomplete combustion (e.g. polycyclic aromatic hydrocarbons) emitted as PM<sub>2.5</sub> from motor vehicles as well as metals and other contaminants emitted from anthropogenic sources, can contaminate PM<sub>10-2.5</sub> (U.S. EPA, 2004, p. 8–344; 71 FR 2665, January 17, 2006). While the Administrator acknowledges the uncertainty expressed in the Integrated Science Assessment regarding the extent to which particle composition can be linked to health outcomes based on available evidence, she also considers the possibility that PM<sub>10-2.5</sub> contaminants typical of urban or industrial areas could increase the toxicity of thoracic coarse particles in urban locations.

Given that the large majority of the evidence for PM<sub>10-2.5</sub> toxicity, particularly at relatively low particle concentrations, comes from study locations where thoracic coarse particles are of urban origin, and given the possibility that PM<sub>10-2.5</sub> contaminants in urban areas could increase particle toxicity, the Administrator concludes that it remains appropriate to maintain a standard that provides some protection in all areas but targets public health protection to urban locations. Specifically, she concludes that it is appropriate to maintain a standard that allows lower ambient concentrations of PM<sub>10-2.5</sub> in urban areas, where the evidence is strongest that thoracic coarse particles are linked to mortality and morbidity, and higher concentrations in non-urban areas, where the public health concerns are less certain.

Given all of the above considerations and conclusions, the Administrator judges that the available evidence supports retaining a PM<sub>10</sub> indicator for a standard that is meant to protect

against exposures to thoracic coarse particles. In reaching this judgment, she notes that, to the extent a PM<sub>10</sub> indicator results in lower allowable concentrations of thoracic coarse particles in some areas compared to others, lower concentrations will be allowed in those locations (i.e., urban or industrial areas) where the science has shown the strongest evidence of adverse health effects associated with exposure to thoracic coarse particles and where we have the most concern regarding PM<sub>10-2.5</sub> toxicity. Therefore, the Administrator concludes that the varying amounts of coarse particles that are allowed in urban vs. non-urban areas under the 24-hour PM<sub>10</sub> standard, based on the varying levels of PM<sub>2.5</sub> present, appropriately reflect the differences in the strength of evidence regarding coarse particle effects in urban and non-urban areas.<sup>133 134</sup>

In reaching this conclusion, the Administrator also notes that, in their review of the second draft Policy Assessment, CASAC concluded that “[w]hile it would be preferable to use an indicator that reflects the coarse PM directly linked to health risks (PM<sub>10-2.5</sub>), CASAC recognizes that there is not yet sufficient data to permit a change in the indicator from PM<sub>10</sub> to one that directly measures thoracic coarse particles” (Samet, 2010d, p. ii). Thus, consistent with the considerations presented above and with CASAC advice, the Administrator concludes that it is appropriate to retain PM<sub>10</sub> as the indicator for thoracic coarse particles.<sup>135</sup>

<sup>133</sup> As discussed in the proposal, the Administrator recognizes that this relationship is qualitative. That is, the varying coarse particle concentrations allowed under the PM<sub>10</sub> standard do not precisely correspond to the variable toxicity of thoracic coarse particles in different areas (insofar as that variability is understood). Although currently available information does not allow any more precise adjustment for relative toxicity, the Administrator believes the standard will generally ensure that the coarse particle levels allowed will be lower in urban areas and higher in non-urban areas. Addressing this qualitative relationship, the DC Circuit held that “[i]t is true that the EPA relies on a qualitative analysis to describe the protection the coarse PM NAAQS will provide. But the fact that the EPA’s analysis is qualitative rather than quantitative does not undermine its validity as an acceptable rationale for the EPA’s decision.” 559 F. 3d at 535.

<sup>134</sup> The D.C. Circuit agreed with similar conclusions in the last review and held that this rationale reasonably supported use of an unqualified PM<sub>10</sub> indicator for thoracic coarse particles. *American Farm Bureau Federation v. EPA*, 559 F. 3d at 535–36.

<sup>135</sup> In addition, CASAC “vigorously recommends the implementation of plans for the deployment of a network of PM<sub>10-2.5</sub> sampling systems so that future epidemiological studies will be able to more thoroughly explore the use of PM<sub>10-2.5</sub> as a more appropriate indicator for thoracic coarse particles” (Samet, 2010d, p. 7). Consideration of alternative indicators (e.g., PM<sub>10-2.5</sub>) in future reviews could be

With regard to the third issue, in evaluating the degree of public health protection provided by the current PM<sub>10</sub> standard, the Administrator first notes that when the available PM<sub>10-2.5</sub> scientific evidence and its associated uncertainties were considered, the Integrated Science Assessment concluded that the evidence is suggestive of a causal relationship between short-term PM<sub>10-2.5</sub> exposures and mortality, cardiovascular effects, and respiratory effects. As discussed above and in more detail in the Integrated Science Assessment (U.S. EPA, 2009a, section 1.5), a suggestive determination is made when the “[e]vidence is suggestive of a causal relationship with relevant pollutant exposures, but is limited because chance, bias and confounding cannot be ruled out.” In contrast, the Administrator notes that she is strengthening the annual fine particle standard based on a body of scientific evidence judged sufficient to conclude that a causal relationship exists (i.e., mortality, cardiovascular effects) or is likely to exist (i.e., respiratory effects). The suggestive judgment for PM<sub>10-2.5</sub> reflects the greater degree of uncertainty associated with this body of evidence, as discussed above and in more detail in the proposal, and as summarized below.

The Administrator notes that the important uncertainties and limitations associated with the scientific evidence and air quality information raise questions as to whether public health benefits would be achieved by revising the existing PM<sub>10</sub> standard. Such uncertainties and limitations include the following:

(1) While PM<sub>10-2.5</sub> effect estimates reported for mortality and morbidity were generally positive, most were not statistically significant, even in single-pollutant models. This includes effect estimates reported in some study locations with PM<sub>10</sub> concentrations above those allowed by the current 24-hour PM<sub>10</sub> standard.

(2) The number of epidemiological studies that have employed co-pollutant models to address the potential for confounding, particularly by PM<sub>2.5</sub>, remains limited. Therefore, the extent to which PM<sub>10-2.5</sub> itself, rather than one or more co-pollutants, contributes to reported health effects remains uncertain.

(3) Only a limited number of experimental studies provide support for the associations reported in epidemiological studies, resulting in further uncertainty regarding the plausibility of the associations between PM<sub>10-2.5</sub> and mortality and morbidity reported in epidemiological studies.

informed by additional research, as described in the Policy Assessment (U.S. EPA, 2011a, section 3.5).



# EXHIBIT 3

# ENVIRONMENTAL PROTECTION AGENCY

## 40 CFR Part 51

[FRL-6353-4]

RIN 2060-AF32

[Docket No A-95-38]

## Regional Haze Regulations

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** Section 169A of the Clean Air Act (CAA) sets forth a national goal for visibility which is the "prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution." There are 156 Class I areas across the country, including many well-known national parks and wilderness areas, such as the Grand Canyon, Great Smokies, Shenandoah, Yellowstone, Yosemite, the Everglades, and the Boundary Waters. Regional haze is visibility impairment caused by the cumulative air pollutant emissions from numerous sources over a wide geographic area. The EPA promulgated regulations in 1980 to address visibility impairment that is "reasonably attributable" to one or a small group of sources, but EPA deferred action on regional haze regulations until monitoring, modeling, and scientific knowledge about the relationship between pollutants and visibility effects improved. In 1993, the National Academy of Sciences (NAS) concluded that "current scientific knowledge is adequate and control technologies are available for taking regulatory action to improve and protect visibility."

On July 31, 1997 (62 FR 41138), EPA published proposed amendments to the 1980 regulations to set forth a program to address regional haze visibility impairment. The EPA also published a notice of availability of additional information on the proposed regional haze regulation on September 3, 1998. This notice took comment specifically on new implementation plan timelines set forth in the Transportation Equity Act for the 21st Century, Public Law 105-178, and on a proposal from the Western Governors' Association (WGA) for addressing the recommendations of the Grand Canyon Visibility Transport Commission (GCVTC) in the final rule. The EPA received more than 1300 comments overall on the proposal and notice of availability.

Today's final rule calls for States to establish goals and emission reduction

strategies for improving visibility in all 156 mandatory Class I national parks and wilderness areas. Specific provisions are included in the rule allowing nine western States to implement the recommendations of the GCVTC within the framework of the national regional haze program. In addition, EPA encourages States to work together in regional partnerships to develop and implement multistate strategies to reduce emissions of visibility-impairing fine particle pollution.

**DATES:** The regulatory amendments announced herein take effect on August 30, 1999.

**ADDRESSES:** *Docket.* The public docket for this action is available for public inspection and copying between 8:00 a.m. and 5:30 p.m., Monday through Friday excluding legal holidays, at the Air and Radiation Docket and Information Center (6102), Attention: Docket A-95-38, Room M-1500, 401 M Street, SW, Washington, DC 20460, phone 202-260-7548, fax 202-260-4400, email: A-and-R-Docket@epamail.epa.gov. A reasonable fee for copying may be charged. The regional haze regulations are subject to the rulemaking procedures under section 307(d) of the CAA. The documents relied on to develop the regional haze regulations have been placed in the docket.

**FOR FURTHER INFORMATION CONTACT:** For general questions regarding this notice, contact Richard Damberg, U.S. EPA, MD-15, Research Triangle Park, NC 27711, telephone (919) 541-5592, email: damberg.rich@epa.gov.

## SUPPLEMENTARY INFORMATION:

### Electronic Availability

The official record for this rulemaking, as well as the public version, has been established under docket number A-95-38 (including comments and data submitted electronically as described below). A public version of this record, including printed, paper versions of electronic comments, which does not include any information claimed as Confidential Business Information, is available for inspection from 8:00 a.m. to 5:30 p.m., Monday through Friday, excluding legal holidays. The official rulemaking record is located at the address in **ADDRESSES** at the beginning of this document. World Wide Web sites have been developed for overview information on visibility issues and related programs. These web sites can be accessed from Uniform Resource Locator (URL): <http://www.epa.gov/airlinks/>.

## Table of Contents

- I. Overview of Today's Final Rule
- II. Background Information on the Regional Haze Program
  - A. Regional Haze
  - B. How Today's Final Rule Responds to the CAA
  - C. The 1980 Visibility Regulation—Commitment to a Regional Haze Program
  - D. Sources of Scientific Information and Policy Recommendations on Regional Haze
  - E. Relationship to Secondary NAAQS for PM
  - F. Regional Planning and Integration with Programs to Implement the NAAQS for Ozone and Particulate Matter
- III. Discussion of National Program Requirements and Response to Comments
  - A. Scope of Rule—Extending Coverage to All States
  - B. Timetable for Submitting the First Regional Haze SIP
  - C. Tracking Decisions and Emissions Reductions
  - D. Regional Haze Implementation Plan Principles
  - E. Determination of "Baseline," "Natural" and "Current" Visibility
  - F. Reasonable Progress Goals
  - G. Long-Term Strategy
  - H. Best Available Retrofit Technology (BART)
  - I. Monitoring Strategy and Other Implementation Plan Requirements
  - J. Periodic SIP Revisions and 5-Year Progress Reports
  - K. Coordination with Federal Land Managers
- IV. Treatment of the GCVTC Recommendations
  - A. Background
  - B. General Requirements of Section 51.309
  - C. Elements of the GCVTC-Based State and Tribal Implementation Plans
  - D. Requirements for States Electing Not To Follow All Provisions of the Section 51.309(e)
  - E. Annex to the GCVTC Report
  - F. Additional Class I Areas
- V. Implementation of the Regional Haze Program in Indian Country
  - A. Background on Tribal Air Quality Programs
  - B. Issues Related to the Regional Haze Program in Indian Country
- VI. Miscellaneous Technical Amendments to the Existing Rule
- VII. Administrative Requirements
  - A. Regulatory Planning and Review by the Office of Management and Budget (OMB) (Executive Order 12866)
  - B. Regulatory Flexibility Act
  - C. Paperwork Reduction Act—Impact on Reporting Requirements
  - D. Unfunded Mandates Reform Act
  - E. Environmental Justice—Executive Order 12898
  - F. Congressional Review Act
  - G. Protection of Children From Environmental Health Risks and Safety Risks—Executive Order 13045
  - H. Enhancing the Intergovernmental Partnership—Executive Order 12875

- I. Executive Order 13084: Consultation and Coordination with Indian Tribal Governments
- J. National Technology Transfer and Advancement Act

## I. Overview of Today's Final Rule

This preamble provides the details and rationale for the final regional haze rule. Unit II includes background information on regional haze and on the legal and scientific basis for today's action. Unit III describes the provisions of the national requirements for regional haze and includes a discussion of the comments received on the July 1997 proposal. Unit IV discusses specific regional provisions for 16 western Class I areas that were the subject of a 1996 report by the GCVTC. Unit V is a discussion of issues related to implementation of the rule by Indian tribes. Unit VI summarizes several technical amendments to existing visibility regulations in order to coordinate those requirements with the requirements of today's final rule. Unit VII discusses how today's final rulemaking is in compliance with the requirements of various executive orders and statutes.

## II. Background Information on the Regional Haze Program

### A. Regional Haze

Regional haze is visibility impairment that is produced by a multitude of sources and activities which emit fine particles and their precursors and which are located across a broad geographic area.<sup>1</sup> Twenty years ago, when initially adopting the visibility protection provisions of the CAA, Congress specifically recognized that the "visibility problem is caused primarily by emission into the atmosphere of SO<sub>2</sub>, oxides of nitrogen, and particulate matter, especially fine particulate matter, from inadequate[ly] controlled sources."<sup>2</sup> The fine particulate matter

(PM) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust) that impairs visibility by scattering and absorbing light can cause serious health effects and mortality in humans, and contribute to environmental effects such as acid deposition and eutrophication.

Data from the existing visibility monitoring network show that visibility impairment caused by air pollution occurs virtually all the time at most national park and wilderness area monitoring stations.<sup>3</sup> Average visual range in many Class I areas<sup>4</sup> in the Western United States is 100–150 kilometers (13.6–9.6 deciviews),<sup>5</sup> or about one-half to two-thirds of the visual range that would exist without manmade air pollution. In most of the east, the average visual range is less than 30 kilometers (25 deciviews or more), or about one-fifth of the visual range that would exist under estimated natural conditions. The role of regional transport of fine particles in contributing to elevated PM levels and regional haze impairment has been well documented by many researchers<sup>6</sup> and

<sup>3</sup> National Park Service. Air Quality in the National Parks: A Summary of Findings from the National Park Service Air Quality Research and Monitoring Program. Natural Resources Report 88–1. Denver, CO, July 1988.

<sup>4</sup> Areas designated as mandatory Class I Federal areas are those national parks exceeding 6000 acres, wilderness areas and national memorial parks exceeding 5000 acres, and all international parks which were in existence on August 7, 1977. Visibility has been identified as an important value in 156 of these areas. See 40 CFR part 81, subpart D. The extent of a Class I area includes subsequent changes in boundaries, such as park expansions. (CAA section 162(a)). States and tribes may designate additional areas as Class I, but the requirements of the visibility program under section 169A of the CAA apply only to "mandatory Class I Federal areas," and they do not directly address any additional areas.

<sup>5</sup> "Deciview" is a visibility metric discussed further in unit III.C. of today's notice, and defined in section 51.301(bb) of the rule. Higher deciview values indicate greater levels of visibility impairment.

<sup>6</sup> See National Acid Precipitation Assessment Program. Acid Deposition: State of Science and Technology. Report 24, Visibility: Existing and Historical Conditions—Causes and Effects, Table 24–6. Washington, DC 1991. See also U.S. EPA. Air Quality Criteria for Particulate Matter. Office of Research and Development, National Center for

recognized as a significant issue by policymakers from Federal, State and local agencies, industry and environmental organizations.

### B. How Today's Final Rule Responds to the CAA

The visibility protection program under sections 169A, 169B, and 110(a)(2)(J) of the CAA is designed to protect Class I areas<sup>7</sup> from impairment due to manmade air pollution. Congress adopted the visibility provisions in the CAA to protect visibility in these "areas of great scenic importance."<sup>8</sup> The current regulatory program addresses visibility impairment in these areas that is "reasonably attributable"<sup>9</sup> to a specific source or small group of sources. In adopting section 169A, the core visibility provisions adopted in the 1977 CAA Amendments, Congress also expressed its concern with visibility problems caused by pollutants that "emanate from a variety of sources." It noted the problem of "hazes" from "regionally distributed sources,"<sup>10</sup> and concluded that additional provisions were needed to remedy "the growing visibility problem." The purpose of today's final rule is to revise the existing visibility regulations<sup>11</sup> in order to integrate provisions addressing regional haze impairment. Today's final rule establishes a comprehensive visibility protection program for Class I areas. Figure 1 is a map indicating the locations of the Class I areas.

### BILLING CODE 6560–50–U

Environmental Assessment. EPA/600/P–95/001bF. Research Triangle Park, NC. 1996.

<sup>7</sup> For the purposes of this preamble, the term "Class I area" will be used to describe the 156 mandatory Class I Federal areas identified in section 51.301(o) and in part 81, subpart D of this title.

<sup>8</sup> H.R. Rep. No. 294, 95th Cong. 1st Sess. at 205 (1977).

<sup>9</sup> "Reasonably attributable" visibility impairment, as defined in section 51.301(s), means "attributable by visual observation or any other technique the State deems appropriate." It includes impacts to Class I areas caused by plumes or layered hazes from a single source or small group of sources.

<sup>10</sup> H.R. Rep. No. 95–294 at 204 (1977).

<sup>11</sup> 45 FR 80084 (December 2, 1980) and section 51.300–307.

<sup>1</sup> U.S. EPA. Air Quality Criteria for Particulate Matter. Office of Research and Development, National Center for Environmental Assessment. EPA/600/P–95/001bF. Research Triangle Park, NC. 1996.

<sup>2</sup> H.R. Rep. No. 95–294 at 204 (1977).

# EXHIBIT 4





**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**

*We Protect Hoosiers and Our Environment.*

100 N. Senate Avenue • Indianapolis, IN 46204

(800) 451-6027 • (317) 232-8603 • [www.idem.IN.gov](http://www.idem.IN.gov)

**Eric J. Holcomb**  
Governor

**Bruno L. Pigott**  
Commissioner

To: Interested Parties

Date: **September 20, 2019**

From: Jenny Acker, Chief  
Permits Branch  
Office of Air Quality

Source Name: BP Products North America, Inc. – Whiting Business Unit

Permit Level: Title V Significant Permit Modification

Permit Number: **089-40517-00453**

Source Location: 2815 Indianapolis Boulevard  
Whiting, Indiana

Type of Action Taken: Modification at an existing source  
Revisions to permit requirements

**Notice of Decision: Approval - Effective Immediately**

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the matter referenced above.

The final decision is available on the IDEM website at: <http://www.in.gov/apps/idem/caats/>  
To view the document, choose Search Option **by Permit Number**, then enter permit 40517.

The final decision is also available via IDEM's Virtual File Cabinet (VFC). Please go to:  
<http://www.IN.idem.gov> and enter VFC in the search box. You will then have the option to search for permit documents using a variety of criteria.

*(continues on next page)*



Page 2 of 13  
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Eric J. Holcomb  
Governor

Bruno L. Pigott  
Commissioner

## Part 70 Operating Permit Renewal OFFICE OF AIR QUALITY

**BP Products North America, Inc., - Whiting Business Unit  
2815 Indianapolis Boulevard  
Whiting, Indiana 46394**

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

**The Permittee must comply with all conditions of this permit. Noncompliance with any provisions of this permit is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Noncompliance with any provision of this permit, except any provision specifically designated as not federally enforceable, constitutes a violation of the Clean Air Act. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. An emergency does constitute an affirmative defense in an enforcement action provided the Permittee complies with the applicable requirements set forth in Section B, Emergency Provisions.**

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Operation Permit No.: T089-30396-00453

Master Agency Interest ID.: 11589

Issued by: Original Signed  
Jenny Acker, Section Chief  
Permits Branch, Office of Air Quality


Issuance Date: January 1, 2015

Expiration Date: January 1, 2020

Administrative Amendment No. 089-35450-00453, issued on February 19, 2015  
Significant Permit Modification 089-35729-00453, issued on September 16, 2015  
Significant Permit Modification 089-36656-00453, issued on June 14, 2016  
Administrative Amendment No. 089-36920-00453, issued on June 15, 2016  
Significant Permit Modification No.: 089-37390-00453, issued on December 28, 2016  
Administrative Amendment No.: 089-38381-00453, issued on May 15, 2017  
Significant Permit Modification No.: 089-38641-00453, issued on October 4, 2017  
Significant Permit Modification No.: 089-38868-00453, issued on January 29, 2018  
Minor Permit Modification No.: 089-39973-00453, issued on August 27, 2018  
Administrative Amendment No.: 089-40242-00453, issued on September 12, 2018

Significant Permit Modification No.: 089-40517-00453

Issued by:

  
Brian Williams, Section Chief  
Permits Branch  
Office of Air Quality

Issuance Date: September 20, 2019

Expiration Date: January 1, 2020



**A.5 Part 70 Permit Applicability [326 IAC 2-7-2]**

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This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because:

- (a) It is a major source, as defined in 326 IAC 2-7-1(22);
- (b) It is a source in a source category designated by the United States Environmental Protection Agency (U.S. EPA) under 40 CFR 70.3 (Part 70 - Applicability).

**SECTION B****GENERAL CONDITIONS****B.1 Definitions [326 IAC 2-7-1]**

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-7) shall prevail.

**B.2 Permit Term [326 IAC 2-7-5(2)] [326 IAC 2-1.1-9.5] [326 IAC 2-7-4(a)(1)(D)] [IC 13-15-3-6(a)]**

- (a) This permit, T089-30396-00453, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit.
- (b) If IDEM, OAQ, upon receiving a timely and complete renewal permit application, fails to issue or deny the permit renewal prior to the expiration date of this permit, this existing permit shall not expire and all terms and conditions shall continue in effect, including any permit shield provided in 326 IAC 2-7-15, until the renewal permit has been issued or denied.

**B.3 Term of Conditions [326 IAC 2-1.1-9.5]**

Notwithstanding the permit term of a permit to construct, a permit to operate, or a permit modification, any condition established in a permit issued pursuant to a permitting program approved in the state implementation plan shall remain in effect until:

- (a) the condition is modified in a subsequent permit action pursuant to Title I of the Clean Air Act; or
- (b) the emission unit to which the condition pertains permanently ceases operation.

**B.4 Enforceability [326 IAC 2-7-7] [IC 13-17-12]**

Unless otherwise stated, all terms and conditions in this permit, including any provisions designed to limit the source's potential to emit, are enforceable by IDEM, the United States Environmental Protection Agency (U.S. EPA) and by citizens in accordance with the Clean Air Act.

**B.5 Severability [326 IAC 2-7-5(5)]**

The provisions of this permit are severable; a determination that any portion of this permit is invalid shall not affect the validity of the remainder of the permit.

**B.6 Property Rights or Exclusive Privilege [326 IAC 2-7-5(6)(D)]**

This permit does not convey any property rights of any sort or any exclusive privilege.

**B.7 Duty to Provide Information [326 IAC 2-7-5(6)(E)]**

- (a) The Permittee shall furnish to IDEM, OAQ, within a reasonable time, any information that IDEM, OAQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. Upon request, the Permittee shall also furnish to IDEM, OAQ copies of records required to be kept by this permit.
- (b) For information furnished by the Permittee to IDEM, OAQ, the Permittee may include a claim of confidentiality in accordance with 326 IAC 17.1. When furnishing copies of requested records directly to U. S. EPA, the Permittee may assert a claim of confidentiality in accordance with 40 CFR 2, Subpart B.

**B.8 Certification [326 IAC 2-7-4(f)] [326 IAC 2-7-6(1)] [326 IAC 2-7-5(3)(C)]**

- (a) A certification required by this permit meets the requirements of 326 IAC 2-7-6(1) if:



thoroughly inspect the affected portion of the facility for the presence of asbestos. The requirement to use an Indiana Licensed Asbestos inspector is not federally enforceable.

### Testing Requirements [326 IAC 2-7-6(1)]

#### C.8 Performance Testing [326 IAC 3-6]

- (a) For performance testing required by this permit, a test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management  
 Compliance and Enforcement Branch, Office of Air Quality  
 100 North Senate Avenue  
 MC 61--53 IGCN 1003  
 Indianapolis, Indiana 46204-2251

no later than thirty--five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

- (b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

- (c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty--five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ if the Permittee submits to IDEM, OAQ a reasonable written explanation not later than five (5) days prior to the end of the initial forty--five (45) day period.

### Compliance Requirements [326 IAC 2-1.1-11]

#### C.9 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U. S. EPA.

### Compliance Monitoring Requirements [326 IAC 2-7-5(1)] [326 IAC 2-7-6(1)]

#### C.10 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)] [40 CFR 64] [326 IAC 3-8]

- (a) For new units:  
 Unless otherwise specified in the approval for the new emission unit(s), compliance monitoring for new emission units shall be implemented on and after the date of initial start-up.
- (b) For existing units:  
 Unless otherwise specified in this permit, for all monitoring requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance, to begin such monitoring. If due to circumstances beyond the Permittee's control, any monitoring equipment required by this permit cannot be installed and operated no later than ninety (90) days after permit issuance, the Permittee may extend the compliance schedule related to the equipment for an additional ninety (90) days provided the Permittee notifies:

Permittee's obligations with regard to the records required by this condition.

- (2) Instead of paper records, the owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements

**C.19 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5] [326 IAC 2-7-6]**

- (a) When the results of a stack test performed in conformance with Section C -- Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall submit a description of its response actions to IDEM, OAQ, no later than seventy-five (75) days after the date of the test.
- (b) A retest to demonstrate compliance shall be performed no later than one hundred eighty (180) days after the date of the test. Should the Permittee demonstrate to IDEM, OAQ that retesting in one -hundred eighty (180) days is not practicable, IDEM, OAQ may extend the retesting deadline.
- (c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The response action documents submitted pursuant to this condition do require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

**C.20 Emission Statement [326 IAC 2-7-5(3)(C)(iii)] [326 IAC 2-7-5(7)] [326 IAC 2-7-19(c)] [326 IAC 2-6]**

Pursuant to 326 IAC 2-6-3(a)(1), the Permittee shall submit by July 1 of each year an emission statement covering the previous calendar year. The emission statement shall contain, at a minimum, the information specified in 326 IAC 2-6-4(c) and shall meet the following requirements:

- (1) Indicate estimated actual emissions of all pollutants listed in 326 IAC 2-6-4(a);
- (2) Indicate estimated actual emissions of regulated pollutants as defined by 326 IAC 2-7-1(33) ("Regulated pollutant, which is used only for purposes of Section 19 of this rule") from the source, for purpose of fee assessment.

The statement must be submitted to:

Indiana Department of Environmental Management  
 Technical Support and Modeling Section, Office of Air Quality  
 100 North Senate Avenue  
 MC 61--50 IGCN 1003  
 Indianapolis, Indiana 46204-2251

The emission statement does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

**SECTION D.24****EMISSIONS UNIT OPERATION CONDITIONS - No. 3 Stanolind Power Station****Emissions Unit Description:**

- (x) A portion of No. 3 Stanolind Power Station (SPS) constructed as listed below and identified as Unit ID 503. The following boilers, all of which burn refinery gas, natural gas, or liquified petroleum gas, are NO<sub>x</sub> budget units:
- (1) Five (5) Boilers, each modified in 2008 as a contemporary project to the WRMP project, each equipped with conventional burners, a Select Catalytic Reduction (SCR) system, and a direct-fired Duct Burner. Each direct-fired Duct Burner rated at 41 mmBTU/hr, equipped with low-Nox burners, and controlled by the Selective Catalytic Reduction (SCR) system. Each stack equipped with continuous emissions monitors (CEMS) for NO<sub>x</sub> and CO:

Boiler and Duct Burner Identification	Maximum Heat Input Capacity (mmBTU/hr)	Installation Date	Modification Date	Emissions Control	Stack Exhausted To
#31 Boiler	575	1948	2010	SCR	503-01
#31 Duct Burner	41	2010	--		(NO <sub>x</sub> & CO CEMS)
#32 Boiler	575	1948	2010	SCR	503-02
#32 Duct Burner	41	2010	--		(NO <sub>x</sub> & CO CEMS)
#33 Boiler	575	1951	2010	SCR	503-03
#33 Duct Burner	41	2010	--		(NO <sub>x</sub> & CO CEMS)
#34 Boiler	575	1951	2010	SCR	503-04
#34 Duct Burner	41	2010	--		(NO <sub>x</sub> & CO CEMS)
#36 Boiler	575	1953	2011	SCR	503-05
#36 Duct Burner	41	2011	--		(NO <sub>x</sub> & CO CEMS)

- (2) Leaks from process equipment, including pumps, pressure relief devices, sampling connection systems, open-ended valves or lines, and instrumentation and heat exchange systems.
- (3) Insignificant Activity: one (1) glycol dehydration unit (GDU) to remove water from the refinery fuel gas system to reduce corrosion, which is composed of a glycol contactor and a stripper. Natural gas is used as the stripping medium. The unit consists of the following equipment: a small (approx. 1,500 gal) tank to deliver glycol to the system, a glycol system of approx. 8,000 gal in capacity, heat exchangers and a coalescer, coolers, condensers, a glycol contactor, a glycol regenerator with a reboiler and stripper, and filters (carbon and sock types).

### Insignificant Activity

- (f) Emission units with PM/PM<sub>10</sub>/PM<sub>2.5</sub> emissions less than five (5) tons per year, SO<sub>2</sub>, NO<sub>x</sub>, and VOC emissions less than ten (10) tons per year, CO emissions less than twenty-five (25) tons per year, lead emissions less than two-tenths (0.2) tons per year, single HAP emissions less than one (1) ton per year, and combination of HAPs emissions less than two and a half (2.5) tons per year [326 IAC 2-1.1-3(e)(1) and 326 IAC 2-7-1(21)(A)-(C)]:
- (6) One (1) lime loading operation at the Main Water Treatment Plant, consisting of two (2) lime silos (Lime Storage Bin North – UT 207 and Lime Storage Bin South- UT 208), permitted in 2014, controlled by one (1) bin vent filter. [326 IAC 6.8-1-2(a)]

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

### Emission Limitations and Standards [326 IAC 2-7-5(1)]

#### D.24.1 Lake County PM<sub>10</sub> Emission Limitations [326 IAC 6.8-2-6]

Pursuant to 326 IAC 6.8-2-6, PM<sub>10</sub> emissions from each stack serving No. 3 power station boilers #31, #32, #33, #34 and #36 shall not exceed 0.0075 pounds per million Btu heat input and 4.28 pounds per hour for each boiler.

These emission limits are specific to the boilers and do not apply to the duct burners or collateral emissions associated with selective catalytic reduction (SCR).

#### D.24.2 Lake County PM<sub>10</sub> Emissions Limitations [326 IAC 6.8-1-2]

Pursuant to 326 IAC 6.8-1-2, PM emissions from the five (5) duct burners and the lime loading operation shall each not exceed 0.03 gr/dscf.

#### D.24.3 Lake County Sulfur Dioxide (SO<sub>2</sub>) Emission Limitations [326 IAC 7-4.1-3]

Pursuant to 326 IAC 7-4.1-3, sulfur dioxide emissions from Boilers #31, #32, #33, #34 and #36 shall each not exceed 18.98 pounds per hour and 0.033 pounds per million Btu heat input.

These emission limits are specific to the boilers and do not apply to the duct burners.

#### D.24.4 Prevention of Significant Deterioration [326 IAC 2-2] and Emission Offset [326 IAC 2-3] Minor Limits

In order to render 326 IAC 2-2 and 326 IAC 2-3 not applicable, the Permittee shall comply with the following for No. 3 Stanolind Power Station Boiler #31 and Duct Burner #31, Boiler #32 and Duct Burner #32, Boiler #33 and Duct Burner #33, Boiler #34 and Duct Burner #34, and Boiler #36 and Duct Burner #36, as measured at Stacks 503-01, 503-02, 503-03, 503-04, and 503-05:

- (a) Pursuant to SSM 089-25484-00453, the Permittee shall comply with the following:
- (1) The emissions of VOC shall not exceed 0.0054 pound per million BTU.
  - (2) The firing rate (total) at the five (5) boilers shall not exceed 24,303,535 mmBTU per twelve (12) consecutive month period, with compliance determined at the end of each month.
  - (3) The firing rate (total) at the five (5) duct burners shall not exceed 1,732,947 mmBTU per twelve (12) consecutive month period, with compliance determined at the end of each month.



- (4) The total emissions of CO shall not exceed 260.4 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.
- (5) The total emissions of NO<sub>x</sub> shall not exceed 260.4 tons per twelve (12) consecutive month period, with compliance determined at the end of each month.
- (b) Pursuant to SSM 089-25484-00453 and as revised by SSM 089-32033-00453, the Permittee shall comply with the following:
  - (1) The emissions of PM shall not exceed 0.012 pound per million BTU.
  - (2) The emissions of PM<sub>10</sub> shall not exceed 0.010 pound per million BTU.
- (c) Pursuant to SSM 089-32033-00453, for all pumps involved in heavy liquid service, after the completion of the WRMP project, the Permittee shall control leaks of VOC from pumps according to the Leak Detection and Repair (LDAR) Plan submitted in accordance with Condition D.24.6. An instrument reading of 2000 parts per million (ppm) or greater shall constitute a leak for pumps in heavy liquid service.

Compliance with the limits on annual firing rates and the NO<sub>x</sub>, VOC, SO<sub>2</sub>, CO, PM and PM<sub>10</sub> emissions limits, in conjunction with the emissions limits at other units at this source, shall ensure that the net emissions increases, including fugitive emissions, for NO<sub>x</sub>, VOC, SO<sub>2</sub>, CO, PM and PM<sub>10</sub> for the WRMP project remain below the significant, rendering 326 IAC 2-2, 326 IAC 2-1.1-4 and 326 IAC 2-3 not applicable for these pollutants.

#### D.24.5 Standards of Performance for Petroleum Refineries [326 IAC 12] [40 CFR 60, Subpart Ja]

- (a) Pursuant to SSM 089-32033-00453 and as required by the Consent Decree entered in Civil No. 2:12-CV-00207, the No. 3 SPS five (5) duct burners are affected facilities for SO<sub>2</sub> as the term is used in 40 CFR 60, Subparts A and Ja, and shall be subject to and comply with the applicable requirements of 40 CFR 60, Subparts A and Ja and specified in Section F.3 for SO<sub>2</sub> emissions for fuel gas combustion devices. Entry of Civil No. 2:12-CV-00207 and compliance with the relevant monitoring requirements of Subpart Ja shall satisfy the notice requirements of 40 CFR § 60.7(a) and the initial performance test requirement of 40 CFR § 60.8(a) for the No.3 SPS five (5) duct burners.
- (b) Pursuant to SSM 089-32033-00453 and as required by the Consent Decree entered in Civil No. 2:12-CV-00207, upon the "Date of Entry" of the Consent Decree in Civil No. 2:12-CV-00207, No. 3 SPS Boilers 31, 32, 33, 34, and 36 shall be affected facilities for SO<sub>2</sub> as the term is used in 40 CFR 60, Subparts A and Ja, and shall be subject to and comply with the applicable requirements of 40 CFR 60, Subparts A and Ja and specified in Section F.3 for SO<sub>2</sub> emissions for fuel gas combustion devices. Entry of Civil No. 2:12-CV-00207 and compliance with the relevant monitoring requirements of Subpart Ja shall satisfy the notice requirements of 40 CFR § 60.7(a) and the initial performance test requirement of 40 CFR § 60.8(a) for No. 3 SPS Boilers 31, 32, 33, 34, and 36.

#### D.24.6 Equipment Leaks of Volatile Organic Compounds (VOC) [326 IAC 8-4-8] [326 IAC 12] [40 CFR 60, Subpart GGGa]

- (a) Pursuant to 326 IAC 8-4-8, the Permittee shall control leaks of VOC from pumps, compressors, valves, process drains, and pressure relief devices according to the Leak Detection and Repair (LDAR) Plan submitted by the Permittee. The Permittee shall update the LDAR Plan as necessary and shall submit a copy of the revised LDAR Plan to IDEM OAQ for approval. If IDEM, OAQ determines that the procedures specified in the LDAR Plan will not demonstrate compliance with the fugitive emission limitations, IDEM, OAQ may request the Permittee to revise the plan.

$E_{\text{tpy}} = \text{lb/mmBTU} [\text{NO}_x] * H * 1 \text{ ton}/2000 \text{ lbs.}$			
Where:			
	$E_{\text{tpy}}$	=	Stack $[\text{NO}_x]$ emissions in tons per year
	lb/mmBTU	=	lb/mmBTU calculated using 40 CFR Part 60, Appendix A, Method 19, using the average concentration as measured by the CEMS over the preceding 12 months.
	H	=	Total heat input in mmBTU to the unit from all fuels fired in the unit over the previous rolling 12-month period

#### D.24.11 Performance Testing Requirements

- (a) Pursuant to SSM 089-32033-00453, the Permittee shall perform VOC testing of SPS #31 Boiler, #32 Boiler, #33 Boiler, #34 Boiler, and #36 Boiler and the five (5) direct-fired duct burners utilizing methods approved by the commissioner. This test shall be repeated at least once every five (5) years from the date of the most recent valid compliance demonstration. Condition D.0.4 – Initial Testing Requirements for Existing Affected Emissions Units contains the Permittee's requirements with regards to the initial compliance demonstration for VOC testing of SPS #31 Boiler, #32 Boiler, #33 Boiler, #34 Boiler, and #36 Boiler and the five (5) direct-fired duct burners. Testing shall be conducted in accordance with the provisions of 326 IAC 3-6 (Source Sampling Procedures). Section C – Performance Testing contains the Permittee's obligation with regard to the performance testing required by this condition.
- (b) In order to demonstrate compliance with Condition D.24.4, the Permittee shall perform PM and PM10 testing of the No. 3 Stanolind Power Station Boiler #31 and Duct Burner #31, Boiler #32 and Duct Burner #32, Boiler #33 and Duct Burner #33, Boiler #34 and Duct Burner #34, and Boiler #36 and Duct Burner #36 utilizing methods as approved by the Commissioner at least once every 5.0 years from the date of the most recent valid compliance demonstration. Condition D.0.4 – Initial Testing Requirements for Existing Affected Emissions Units contains the Permittee's requirements with regards to the initial compliance demonstration for PM and PM10 testing of SPS #31 Boiler, #32 Boiler, #33 Boiler, #34 Boiler, and #36 Boiler and the five (5) direct-fired duct burners. Testing shall be conducted in accordance with the provisions of 326 IAC 3-6 (Source Sampling Procedures). Section C – Performance Testing contains the Permittee's obligation with regard to the performance testing required by this condition. PM10 includes filterable and condensable PM.

#### D.24.12 Continuous Emissions Monitoring

- (a) Pursuant to SSM 089-32033-00453 and as specified by the Consent Decree entered in Civil No. 2:12-CV-00207, by December 31, 2013, the Permittee shall install Total Sulfur Continuous Analyzers on the refinery fuel gas systems to continuously monitor, measure and record the total sulfur concentration of fuel gas burned in the No. 3 SPS Boilers 31, 32, 33, 34, and 36 and the five (5) duct burners. The Total Sulfur Continuous Analyzers shall be installed, operated and calibrated pursuant to ASTM D7166-10 and 40 CFR Part 60 Appendices A and F, and the applicable performance specification test of 40 CFR Part 60 Appendix B, except that in lieu of the requirements of 40 CFR Part 60, Appendix F §§ 5.1.1, 5.1.3 and 5.1.4, the Permittee must conduct a Relative Accuracy Audit (RAA) or a Relative Accuracy Test Audit (RATA) on each Total Sulfur Continuous Analyzer at least

once every three (3) years. The Permittee must also conduct Cylinder Gas Audits each Calendar Quarter during which a RAA or a RATA is not performed. For RATA and RAA reference method comparisons, EPA Methods 15A or 16C shall be used as the reference method. In addition, the Permittee may also use the principles of EPA Method 7E, section 8.3 to dilute the fuel gas samples used for the reference method as necessary to render the samples safe for analysis. Consistent with 40 CFR § 60.107a(a)(2)(iv), the Permittee shall monitor refinery fuel gas at locations that accurately represent the total sulfur concentration in the refinery fuel gas being burned in all heaters and boilers in the refinery, other than refinery fuel gas that would be exempt from monitoring under 40 CFR § 60.107a(a)(3).

- (b) The Total Sulfur Continuous Analyzers, CO and NO<sub>x</sub> continuous emission monitoring systems (CEMS) for the boiler/duct burner stacks shall be calibrated, maintained, and operated for measuring total sulfur, CO and NO<sub>x</sub> in accordance with the applicable requirements in Section C - Maintenance of Continuous Emission Monitoring Equipment and Section C - Maintenance of Emission Monitoring Equipment.

### Compliance Monitoring Requirements

#### D.24.13 Monitoring for Equipment Leaks of VOC [326 IAC 8-4-8]

Pursuant to 326 IAC 8-4-8, the Permittee shall monitor for leaks of VOC according to the LDAR plan submitted by the Permittee.

### Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

#### D.24.14 Record Keeping Requirements

- (a) Pursuant to 326 IAC 7-4.1-3(b)(1)(A) and to document the compliance status with Conditions D.24.3 and D.24.8 the Permittee shall maintain a daily record of the following for the No. 3 SPS Boilers:
  - (1) operational status of each facility,
  - (2) fuel type,
  - (3) average daily sulfur content for each fuel type,
  - (4) average daily fuel gravity for each fuel type,
  - (5) total daily fuel usage for each type, and
  - (6) heat content of each fuel type.
- (b) Pursuant to 326 IAC 8-4-8 and to document the compliance status with Condition D.24.6(a), the Permittee shall comply with equipment leak record keeping requirements specified in the LDAR plan.
- (c) In order to document the compliance status with Condition D.24.4, the Permittee shall maintain records of monthly firing rates and CO emissions at No. 3 Stanolind Power Station boilers 31, 32, 33, 34, 36 and the five (5) duct burners.
- (d) Pursuant to 40 CFR 60, Subpart Ja and to document the compliance status with Condition D.24.5, the Permittee shall maintain the records specified in Section F.3.
- (e) Pursuant to 40 CFR 60, Subpart GGGa and to document the compliance status with Condition D.24.6(b), the Permittee shall maintain records as specified in Section F.9.
- (f) Pursuant to 326 IAC 3-5-6 and to document the compliance status with Condition D.24.12, the Permittee shall keep the following records for the continuous emission monitors:
  - (1) One-minute block averages.

- (2) All documentation relating to:
  - (A) design, installation, and testing of all elements of the monitoring system, and
  - (B) required corrective action or compliance plan activities.
- (3) All maintenance logs, calibration checks, and other required quality assurance activities,
- (4) All records of corrective and preventive action, and
- (5) A log of plant operations, including the following:
  - (A) Date of facility downtime,
  - (B) Time of commencement and completion of downtime, and
  - (C) Reason for each downtime.
- (g) Section C - General Record Keeping Requirements contains the Permittee's obligations with regard to the records required by Paragraphs (a), (b), (c), and (f) of this condition.

#### **D.24.15 Reporting Requirements**

- (a) Pursuant to 326 IAC 7-4.1-3(b)(2) and to document the compliance status with Conditions D.24.3 and D.24.8, the Permittee shall submit a report to IDEM, OAQ not later than thirty (30) days after the end of each calendar quarter containing the average daily sulfur dioxide emission rate, in pounds per hour for the No. 3 SPS Boilers.
- (b) Pursuant to 326 IAC 8-4-8 and to document the compliance status with Condition D.24.6(a) the Permittee shall submit reports as specified in the LDAR plan.
- (c) Pursuant to 40 CFR 60, Subpart Ja and to document the compliance status with Condition D.24.5, the Permittee shall submit reports as specified in Section F.3.
- (d) In order to document the compliance status with Condition D.24.4, the Permittee shall submit a quarterly summary of the monthly firing rates and CO emissions for the boilers 31, 32, 33, 34, 36, and five (5) duct burners not later than thirty (30) days after the end of the quarter being reported.
- (e) Pursuant to 326 IAC 3-5-7 and to document the compliance status with Conditions D.24.4 and D.24.12, the Permittee shall submit reports of excess CO and NO<sub>x</sub> emissions not later than thirty (30) days of the end of each quarter in which the excess emissions occur. The reports shall include the following:
  - (1) Monitored facility operation time during the reporting period,
  - (2) Date of excess emissions,
  - (3) Time of commencement and completion for each excess emission,
  - (4) Magnitude of each excess emission. For gaseous emissions, the excess emissions, in units of the applicable standard, must be reported based on the applicable averaging time, for example, one (1) hour block, three (3) hour block, three (3) hour rolling, in addition to any other reporting requirements that may be applicable.
  - (5) A summary itemizing the exceedances by cause.
  - (6) Continuous Monitoring system instrument downtime, except for zero (0) and span checks, which shall be reported separately, shall include the following:
    - (A) Date of downtime.
    - (B) Time of commencement.
    - (C) Duration of each downtime.
    - (D) Reasons for each downtime.
    - (E) Nature of system repairs and adjustments.



- (f) Pursuant to 40 CFR 60, Subpart GGGa and to document the compliance status with Condition D.24.6(b), the Permittee shall submit reports as specified in Section F.9.
- (g) Section C - General Reporting Requirements contains the Permittee's obligation with regard to the reporting required by Paragraphs (a), (b), (d) and (e) of this condition. A quarterly report does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

# EXHIBIT 5



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Eric J. Holcomb  
Governor

**MAR 21 2019**

Bruno L. Pigott  
Commissioner

VIA CERTIFIED MAIL 7002 0510 0002 5821 7440

Quarshie Awuah-Okyere,  
Manager Environmental  
BP Products North America, Inc.  
2815 Indianapolis Boulevard  
Whiting, IN 46394

Re: Emissions Exceedance  
Enforcement Action Letter  
BP Products North America, Inc.  
089-00453  
Whiting, Lake County

Dear Mr. Mr. Awuah-Okyere:

The Indiana Department of Environmental Management, Office of Air Quality (OAQ) reviewed the compliance testing conducted at BP Products North America, Inc. located at 2815 Indianapolis Boulevard in Whiting, IN on **October 8 and 9, 2018**. The review demonstrated the following violations for the Stanolind Power Station (SPS) Boilers 31 and 32:

- **PM10 emissions from the SPS Boiler 31 exceeded the allowable limit specified in Part 70 Permit 089-38868-00453 condition D.24.4(b)(2). Specifically, you emitted 0.0112 pounds of PM10 per mmBtu which violated the limit of 0.010 pounds/mmBtu.**
- **PM10 emissions from the SPS Boiler 32 exceeded the allowable limit specified in Part 70 Permit 089-38868-00453 condition D.24.4(b)(2). Specifically, you emitted 0.0126 pounds of PM10 per mmBtu which violated the limit of 0.010 pounds/mmBtu**

**Additionally, the PM10 emissions for SPS Boilers 33 and 34 were not able to be determined during testing conducted on October 11 and 12, 2018, respectively.**

This matter has been referred for formal enforcement. IDEM Office of Air Quality would like to take this opportunity to encourage discussions concerning the facts of the case and any additional information that may be available and to provide you with information concerning the enforcement process.



To discuss this matter or to schedule an informational meeting regarding this matter, please contact your Case Manager, Matthew Chaifetz, via telephone at 317-232-8408 or via email at [mchaifetz@idem.IN.gov](mailto:mchaifetz@idem.IN.gov) within fifteen (15) days after receipt of this letter.

Sincerely,



David P. McIver, Chief  
Enforcement Section  
Office of Air Quality

ACES: 232109 & 232110

cc: Lake County Health Department  
Sasa Dunovic, Compliance and Enforcement Branch, OAQ  
Thomas Kline, Compliance Data Section, OAQ  
Matthew Chaifetz, Compliance and Enforcement Branch, OAQ



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# EXHIBIT 6



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Eric J. Holcomb  
Governor

AUG 01 2017

Bruno L. Pigott  
Commissioner

### NOTICE OF VIOLATION

*Via Certified Mail*

No.: 7016 3010 0001 0287 5436

*Via Certified Mail No.:* 7016 3010 0001 0287 5443

To: Don Porter, Refinery Manager  
BP Products North America, Inc.  
2815 Indianapolis Blvd.  
Whiting, IN 46394

To: CT Corporation System, Registered Agent  
150 West Market Street, Suite 800  
Indianapolis, IN 46204

Case No. 2016-23787-A & 2016-24090-A

Based on an investigation, the Indiana Department of Environmental Management ("IDEM") has reason to believe that BP Products North America, Inc. ("Respondent") has violated environmental rules and permits. The violations are based on the following:

1. Respondent owns and operates a source with Plant I.D. No. 089-00453 located at 2815 Indianapolis Blvd. in Whiting, Lake County, Indiana (the "Site").
2. Pursuant to Condition D.0.4 of Part 70 Operating Permit No. 089-30396-00453 (the "Permit"), not later than three (3) years after completion of the WRMP project, the Respondent shall conduct the initial performance testing for NO<sub>x</sub>, CO, PM, PM<sub>10</sub>, and VOC for no less than fifty percent (50%) of the emissions units listed in Table D.0.4.

Respondent has not conducted complete testing to demonstrate compliance with the 326 IAC 6.8-2-6 PM<sub>10</sub> limit on Boiler #32 and Boiler #36, which are part of the emission units requiring testing in Table D.0.4, and as such, did not conduct complete tests on fifty percent (50%) of the emission units, in violation of Condition D.0.4 of the Permit.

3. Pursuant to Condition D.24.4 (b)(3) of the Permit and 326 IAC 2-2, PM<sub>10</sub> emissions from each stack serving No. 3 power station boilers #32 and #36 shall not exceed 0.010 pound per million Btu heat input.

Compliance testing performed by Respondent on Boiler #32 on August 3, 2015, October 20, 2015, and January 28, 2016, and Boiler #36 on August 5, 2015 and October 21, 2015, indicated that PM<sub>10</sub> emissions were in excess of 0.010 lb/MMBtu, in violation of D.24.4(b)(3) of the Permit and 326 IAC 2-2.

4. Pursuant to Condition C.19 of the Permit, a retest shall be performed no later than one hundred eighty (180) days after the date of the initial test.

According to our records, the Respondent did not retest the No. 3 power station boilers #36 and #32 for compliance within one hundred eighty (180) days of the noncompliant tests dated October 21, 2015 and January 28, 2016, respectively, in violation of Condition C.19 of the Permit.

In accordance with IC 13-30-3-3, the Commissioner herein provides notice that violations may exist and offers an opportunity to enter into an Agreed Order providing for the actions required to correct the violations and, as necessary and appropriate, for the payment of a civil penalty. The Commissioner is not required to extend this offer for more than sixty (60) days.

As provided in IC 13-30-3-3, an alleged violator may enter into an Agreed Order without admitting that the violations occurred. IDEM encourages settlement by Agreed Order, thereby resulting in quicker correction of the environmental violations and avoidance of extensive litigation. Timely settlement by Agreed Order may result in a reduced civil penalty. Also, settlement discussions will allow the opportunity to present any mitigating factors that may be relevant to the violations.

If an Agreed Order is not entered into within sixty (60) days of receipt of this Notice of Violation, the Commissioner may issue a Notice and Order under IC 13-30-3-4 containing the actions that must be taken to correct the violations and requiring the payment of an appropriate civil penalty. Pursuant to IC 13-30-4-1, the Commissioner may assess penalties of up to \$25,000 per day for each violation.

Please contact Clifford Yukawa at (219) 250-0350 within fifteen (15) days after receipt of this Notice to discuss resolution of this matter.

For the Commissioner:

Date: 8/1/17

  
Phil Perry, Chief  
Compliance and Enforcement Branch  
Office of Air Quality

cc: Rochelle Marceillars, US EPA Region 5  
Lake County Health Department  
Clifford Yukawa, Compliance and Enforcement Branch, OAQ  
Kale Popp, Compliance Data Section, OAQ  
<http://www.in.gov/idem/enforcement/>



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1. Article Addressed to:  
60-02A/gjr 2016-23787-A & 2016-24090-A NOV

DON PORTER REFINERY MANAGER  
BP PRODUCTS NORTH AMERICA INC  
2815 INDIANAPOLIS BLVD  
WHITING IN 46394



9590 9402 2483 6306 8655 97

2. Article Number (Transfer from service label)

7016 3010 0001 0287 5436

PS Form 3811, July 2015 PSN 7530-02-000-9053

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X *[Signature]*

☐ Agent  
☐ Addressee

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*Eric Ramirez*

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*8/3/17*

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1. Article Addressed to:

60-02A/gjr 2016-23787-A & 2016-24090-A NOV

CT CORPORATION SYSTEM REGISTERED AGENT  
150 W MARKET ST  
STE 800  
INDIANAPOLIS IN 46204



9590 9402 2483 6306 8655 80

2. Article Number (Transfer from service label)

7016 3010 0001 0287 5443

PS Form 3811, July 2015 PSN 7530-02-000-9053

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A. Signature

X

*[Handwritten Signature]*

- ☐ Agent
- ☐ Addressee

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8-4-17

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- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Mail Restricted Delivery  
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# EXHIBIT 7



# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Eric J. Holcomb  
Governor

DEC 15 2017

Bruno L. Pigott  
Commissioner

VIA CERTIFIED MAIL 7017 0190 0000 9498 8537

Ken Taylor  
BP Products North America, Inc –  
Whiting Business Unit  
2815 Indianapolis Blvd.  
PO Box 710  
Whiting, IN 46394-0710

Re: Stack Test Review/ Enforcement  
Action Letter  
BP Products North America, Inc –  
Whiting Business Unit  
Plant ID 089-00453  
Whiting, Lake County

Dear Mr. Taylor:

Representatives of the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ), have reviewed compliance testing results concerning BP Products North America, Inc. – Whiting Business Unit located at 2815 Indianapolis Blvd. in Whiting, Indiana. As a result of information obtained during that review, IDEM alleges violations of Part 70 Permit 089-37370-00453 have occurred.

Testing conducted on November 1-3, 2016, showed PM10 emissions from the Boiler 32 and Boiler 36 did not meet the requirements in Part 70 Permit 089-37370-00453 Conditions D.24.1 and D.24.4 which are violations of 326 IAC 6.8-2-6 and 326 IAC 2-2, respectively.

Violation 326 IAC 6.8-2-6 (Condition D.24.1)

Boiler 32

PM10 Emission Limit:	4.28 lb/hr
Average PM10 Emission Rate	7.13 lb/hr
PM10 Emission limit	0.0075 lb/MMBtu
Average PM10 Emission Rate	0.012 lb/MMBtu

Violation 326 IAC 6.8-2-6 (Condition D.24.1)

Boiler 36

PM10 Emission Limit:	4.28 lb/hr
Average PM10 Emission Rate	12.95 lb/hr
PM10 Emission limit	0.0075 lb/MMBtu
Average PM10 Emission Rate	0.021 lb/MMBtu



**Violation 326 IAC 2-2 (Condition D.24.4)**

Boiler 36

PM10 Emission Limit:

0.010 lb/MMBtu

Average PM10 Emission Rate


0.020 lb/MMBtu

Additionally, pursuant to Condition C.19(b), a retest to demonstrate compliance shall be performed no later than one hundred eighty (180) days after the date of the test. Neither Boiler 32 nor Boiler 36 met the 180 day requirement and are considered a violation of the permit.

This matter will be referred for formal enforcement action. IDEM OAQ would like to take this opportunity to encourage discussions concerning the facts of the case, any additional information that may be available, and to provide you with information concerning the enforcement process.

To discuss this matter or schedule an informational meeting concerning this matter, please contact Matthew Chaifetz at (317)232-8408 or [mchaifet@idem.IN.gov](mailto:mchaifet@idem.IN.gov) within fifteen (15) days after receipt of this letter.

Sincerely,



David P. McIver, Chief  
Enforcement Section  
Office of Air Quality

ACES ID: 217424 & 217427

cc: Lake County Health Department  
Matthew Chaifetz, Compliance and Enforcement, OAQ, via electronic delivery  
Kale Popp, Compliance and Enforcement, OAQ, via electronic delivery  
Rick Massoels, Deputy Director, Northwest Regional Office, via electronic delivery  
Sasa Dunovic, Northwest Regional Office, via electronic delivery

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## 1. Article Addressed to:

60-02A/gjr      ENF ACT - 089-00453  
KEN TAYLOR  
BP PRODUCTS NORTH AMERICA INC  
WHITING BUSINESS UNIT  
2815 INDIANAPOLIS BLVD  
PO BOX 710  
WHITING IN 46394-0710

## 2. Article Number

(Transfer to)

7017 0190 0000 9498 8537

**COMPLETE THIS SECTION ON DELIVERY**

## A. Signature

☐ Agent☐ Addressee

## B. Received by (Printed Name)

Eric Ramon

## C. Date of Delivery

10/18/17

## D. Is delivery address different from item 1?

☐ Yes

If YES, enter delivery address below:

☐ No

## 3. Service Type

☒ Certified Mail☐ Express Mail☐ Registered☐ Return Receipt for Merchandise☐ Insured Mail☐ C.O.D.

## 4. Restricted Delivery? (Extra Fee)

☐ Yes

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

# EXHIBIT 8



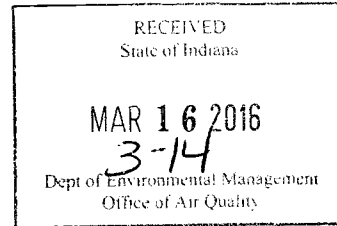
BP Products North America Inc.  
2815 Indianapolis Blvd.  
P.O. Box 710  
Whiting, IN 46394-0710  
USA

PC  
TBAW  
LB

**CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

March 11, 2016

Dave Cline  
Section Chief  
Indiana Department of Environmental Management  
100 North Senate Avenue  
MC61-53 IGCN 1003  
Indianapolis, IN 46204-2251



**RE: Performance Test Report – No. 3 Stanolind Power Station (3SPS) Boilers 32 and 36**

Dear Mr. Cline:

The performance test results for the No. 3 Stanolind Power Station (3SPS) Boiler 32 at the BP Products North America Inc. - Whiting Business Unit (BP Whiting) are attached. Clean Air Engineering performed the tests on January 28, 2016. It should be noted that the PM<sub>10</sub> results on both Boilers 32 and 36 are unusual and unexpected, and a review is currently underway regarding these results.

Location	Parameter	EPA Test Method	Results	Allowable	Test Date
Boiler 32	PM <sub>10</sub>	201A/202	0.020 lb/MMBtu	0.010 lb/MMBtu	January 28, 2016

In accordance with the BP Whiting Title V Permit, Condition C.19, this letter constitutes notification of response actions to these test results for Boiler 32. As stated above, BP Whiting is continuing its review of potential process contributions to condensable PM, as well as potential sources of uncertainty in the test methods for condensable PM. BP Whiting will perform a re-test of Boiler 32 after completing the review referenced above, and implementing any required operational or test method changes.

If you require additional information regarding the test report, please call Ken Taylor at (219) 473-2133.

Sincerely,

Linda Wilson  
Environmental Manager  
Health, Safety, Security and the Environment

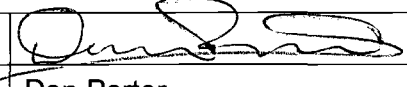
Attachments

cc: K. Sokolowski – NW IDEM (ksokolow@idem.in.gov)

**PART 70 OPERATING PERMIT  
CERTIFICATION**

Source Name: BP Products North America, Inc., Whiting Business Unit  
Source Address: 2815 Indianapolis Blvd., Whiting, IN 46394  
Mailing Address: P.O. Box 710, Whiting, Indiana 46394-0710  
Permit No.: T089-30396-00453  
Last updated on Sept 16, 2015 per SPM 089-35729-00453

<b>This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.</b>
Please check what document is being certified:
<input type="checkbox"/> Annual Compliance Certification Letter
<input checked="" type="checkbox"/> Test Results (specify) No. 3 Stanolind Power Station Boilers 32, per Operating Permit No T089-30396-00453 for Significant Permit Modification No. 089-35729-00453 issued on September 16, 2015, conditions D.24.4(a)(1) and D.24.4(b)(3).
<input type="checkbox"/> Report (specify)
<input type="checkbox"/> Notification (specify)
<input type="checkbox"/> Affidavit (specify)
<input type="checkbox"/> Other (specify)

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.	
Signature of Responsible Official:	
Printed Name:	Don Porter
Title/Position:	Refinery Manager
Phone:	(219) 473-3179
Date:	3-11-16





BP Whiting  
2185 Indianapolis Blvd  
Whiting, IN 46394

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**REPORT ON PARTICULATE TESTING**

Performed for:  
**BP WHITING**  
**BOILER 32**  
**WHITING, IN**

Client Reference No: 3000490168  
CleanAir Project No: 12917  
Revision 0: March 8, 2016

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To the best of our knowledge, the data presented in this report are accurate, complete, error free and representative of the actual emissions during the test program. Clean Air Engineering operates in conformance with the requirements of ASTM D7036-04 Standard Practice for Competence of Air Emission Testing Bodies.

Submitted by,

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Jaci Amundsen  
Project Engineer  
jamundsen@cleanair.com  
847-654-4521

Reviewed by,

---

Ken Sullivan  
Project Engineer  
ksullivan@cleanair.com  
847-654-4527

# EXHIBIT 9



6. Plaintiff obtained all of the stack test reports and corresponding IDEM memoranda excerpted and attached to Plaintiff's Complaint, Compl. Ex. 7-14, directly from IDEM's Virtual File Cabinet. The unabridged originals remain readily available and locatable on IDEM's Virtual File Cabinet, <https://vfc.idem.in.gov/DocumentSearch.aspx>.

7. I have personally conducted several good faith searches of IDEM's Virtual File Cabinet, both before and after Plaintiff's February 22, 2019 notice of intent and Plaintiff's September 6, 2019 Complaint, for materials that may be relevant to Plaintiff's claims regarding the five boiler stacks at issue in its Complaint, including additional stack tests. Prior to filing its Complaint, Plaintiff also requested that BP identify any other stack tests at these boilers that BP believed could be relevant to Plaintiff's claims.

8. I have been unable to locate any additional stack tests that may have been performed at the three boiler stacks at issue in this motion for the purpose of demonstrating compliance with their applicable PM<sub>10</sub> emissions limit through my own efforts. Nor has BP provided us with any such additional stack tests.

9. Plaintiff obtained the notices of violation excerpted and attached to Plaintiff's Memorandum in Support of its Motion for Partial Summary Judgment, Ex. 6-8, directly from IDEM's Virtual File Cabinet. The unabridged originals remain readily available and locatable on IDEM's Virtual File Cabinet.

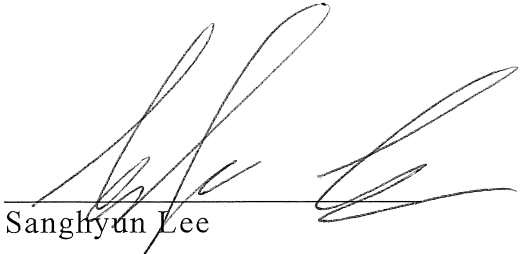
10. IDEM also maintains an Air Quality Permit Database, which provides access to public records relating to Clean Air Act "Title V" permitting actions for sources in the state, including draft permits, final permits, and permit applications.

11. Plaintiff obtained the 2019 Title V operating permit for Whiting Refinery excerpted and attached to Plaintiff's Memorandum in Support of Partial Summary Judgment, Ex. 4, directly

from IDEM's Air Quality Permit Database. The unabridged original, as well as all prior iterations of Whiting Refinery's operating permit referenced (but not included) in Plaintiff's brief and Complaint, remain readily available and locatable on IDEM's website, at <https://www.in.gov/apps/idem/caats/sourceDetail.xhtml?sourceId=089-00453>.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Date: March 12, 2020

  
Sanghyun Lee



# EXHIBIT 10



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
ENFORCEMENT AND  
COMPLIANCE ASSURANCE

August 25, 2014

MEMORANDUM

**SUBJECT:** Revision of U.S. Environmental Protection Agency's Enforcement Response Policy for High Priority Violations of the Clean Air Act: *Timely and Appropriate Enforcement Response to High Priority Violations- 2014*.

**FROM:** Phillip A. Brooks *PAB*  
Director, Air Enforcement Division  
Office of Civil Enforcement

**TO:** Regional Air Enforcement Division Directors, Regions 1-10  
Regional Air Enforcement Branch Chiefs, Regions 1-10  
Regional Counsels, Regions 1-10

**CC:** Environmental Council of States  
National Association of Clean Air Agencies  
Association of Air Pollution Control Agencies

Attached is the revision to the U.S. Environmental Protection Agency's (EPA) enforcement response policy for High Priority Violations of the Clean Air Act (CAA) - *Timely and Appropriate Enforcement Response to High Priority Violations- Revised 2014*. This revision supersedes *The Timely and Appropriate (T&A) Enforcement Response to High Priority Violations (HPVs)* issued in 1998. This revision reflects what the EPA has learned and how enforcement decisions have changed over the past 15 years.

The EPA considers all violations important. HPVs, however, are a subset of violations of regulations authorized by the CAA that warrant additional scrutiny to ensure that state, local, territorial and tribal agencies (referred to collectively as enforcement agencies) respond to such violations in an appropriate manner and, if needed, have access to federal assistance.

This policy revision reflects two substantial changes from the 1998 policy that the EPA determined is appropriate after consultation and input from our enforcement partners. First and

authorities and the EPA has granted delegation to enforce such regulations in lieu of the NSPS where such violation continued (or is expected to continue) for at least seven days. This criterion includes violations that, while not necessarily continuous for 168 hours, recur (or recurred) regularly or intermittently for at least seven days. The EPA presumes that the violation is continuing unless the enforcement agency can document sufficient evidence to conclude that the violation is no longer ongoing and is unlikely to recur.

**Criterion 4** – A violation of any emission limitation, standard or surrogate parameter (emission or operating) of an applicable National Emission Standards for Hazardous Air Pollutants (NESHAP) (Parts 61 and 63) or in an analogous regulation adopted by state, local, tribal or territorial authorities and EPA has granted delegation to enforce such regulations in lieu of the NESHAP where such violation continued (or is expected to continue) for at least seven days. This criterion includes violations that, while not necessarily continuous for 168 hours, recur (or recurred) regularly or intermittently for at least seven days. The EPA presumes that the violation is continuing unless the enforcement agency can document sufficient evidence to conclude that the violation is no longer ongoing and is unlikely to recur.

**Criterion 5** – A violation that involves federally enforceable work practices, testing requirements, monitoring requirements, recordkeeping or reporting that substantially interferes with enforcement of a requirement or a determination of the source's compliance. The determination of what is substantial shall be part of a case-by-case analysis/discussion between the EPA Region and the enforcement agency.

**Criterion 6** – Any other violations specifically identified and communicated to enforcement agencies from time to time by the Director, Air Enforcement Division (AED), U.S. EPA (general applicability) or as mutually agreed upon between the enforcement agency and corresponding EPA Region (case-by-case). For example, an enforcement agency believes an emission violation warrants designation as an HPV even though the violation lasted (or will last) for less than seven days.

### III. INITIAL HPV IDENTIFICATION- DAY ZERO

Once an enforcement agency identifies a potential violation of a federal requirement, prompt determination whether the violation meets the HPV criteria is critical to achieving the goals of this policy. When an enforcement agency first receives information that indicates a potential violation (*e.g.*, through a compliance evaluation, stack test results, continuous emission monitoring system report, etc.), the agency is to determine whether the potential violation meets any of the HPV criteria. The enforcement agency should take prompt steps to gather any additional information needed to determine whether the violation is an HPV.

HPV identification should occur as soon as possible after the enforcement agency receives information sufficient to determine whether a potential violation meets the HPV criteria. The date of the initial identification of a violation as an HPV is called Day Zero for purposes of

# EXHIBIT 11



# Federal Register

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**Tuesday,  
December 21, 2010**

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## **Part II**

## **Environmental Protection Agency**

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### **40 CFR Part 51**

**Methods for Measurement of Filterable  
PM<sub>10</sub> and PM<sub>2.5</sub> and Measurement of  
Condensable PM Emissions From  
Stationary Sources; Final Rule**



**ENVIRONMENTAL PROTECTION AGENCY****40 CFR Part 51**

[EPA-HQ-OAR-2008-0348; FRL-9236-2]

RIN 2060-AO58

**Methods for Measurement of Filterable PM<sub>10</sub> and PM<sub>2.5</sub> and Measurement of Condensable PM Emissions From Stationary Sources****AGENCY:** Environmental Protection Agency (EPA).**ACTION:** Final rule.

**SUMMARY:** This action promulgates amendments to Methods 201A and 202. The final amendments to Method 201A add a particle-sizing device to allow for sampling of particulate matter with mean aerodynamic diameters less than or equal to 2.5 micrometers (PM<sub>2.5</sub> or fine particulate matter). The final amendments to Method 202 revise the sample collection and recovery procedures of the method to reduce the formation of reaction artifacts that could lead to inaccurate measurements of condensable particulate matter. Additionally, the final amendments to Method 202 eliminate most of the hardware and analytical options in the existing method, thereby increasing the precision of the method and improving the consistency in the measurements obtained between source tests performed under different regulatory authorities.

This action also announces that EPA is taking no action to affect the already established January 1, 2011 sunset date for the New Source Review (NSR) transition period, during which EPA is not requiring that State NSR programs address condensable particulate matter emissions.

**DATES:** This final action is effective on January 1, 2011.

**ADDRESSES:** EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2008-0348. All documents are listed in the <http://www.regulations.gov> index. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy form. Publicly available docket materials are available either electronically at <http://www.regulations.gov> or in hard copy at the EPA Docket Center EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading

Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket Center is (202) 566-1742.

**FOR FURTHER INFORMATION CONTACT:** For general information, contact Ms. Candace Sorrell, U.S. EPA, Office of Air Quality Planning and Standards, Air Quality Assessment Division, Measurement Technology Group (E143-02), Research Triangle Park, NC 27711; telephone number: (919) 541-1064; fax number: (919) 541-0516; e-mail address: [sorrell.candace@epa.gov](mailto:sorrell.candace@epa.gov). For technical questions, contact Mr. Ron Myers, U.S. EPA, Office of Air Quality Planning and Standards, Sector Policies and Programs Division, Measurement Policy Group (D243-05), Research Triangle Park, NC 27711; telephone number: (919) 541-5407; fax number: (919) 541-1039; e-mail address: [myers.ron@epa.gov](mailto:myers.ron@epa.gov).

**SUPPLEMENTARY INFORMATION:**

*Acronyms and Abbreviations.* The following acronyms and abbreviations are used in this document.

Δp<sub>max</sub> maximum velocity pressure  
 Δp<sub>min</sub> minimum velocity pressure  
 μm micrometers  
 ASTM American Society for Testing and Materials  
 AWMA Air and Waste Management Association  
 CAA Clean Air Act  
 CBI confidential business information  
 CCM Controlled Condensation Method  
 CPM condensable PM  
 DOP dioctyl phthalate  
 DOT Department of Transportation  
 DQO data quality objective  
 MSHA Mine Safety and Health Administration  
 NAAQS National Ambient Air Quality Standards  
 NSR New Source Review  
 NTTAA National Technology Transfer and Advancement Act of 1995  
 OSHA Occupational Safety and Health Administration  
 PCB polychlorinated biphenyl  
 PM particulate matter  
 PM<sub>10</sub> particulate matter less than or equal to 10 micrometers  
 PM<sub>2.5</sub> particulate matter less than or equal to 2.5 micrometers  
 ppmw parts per million by weight  
 PTFE polytetrafluoropolymer  
 RCRA Resource Conservation and Recovery Act  
 RFA Regulatory Flexibility Act  
 SBA Small Business Administration  
 SIP State Implementation Plan  
 SO<sub>2</sub> sulfur dioxide  
 TDS total dissolved solids  
 TTN Technology Transfer Network  
 UMRA Unfunded Mandates Reform Act  
 www World Wide Web

The information in this preamble is organized as follows:

**I. General Information**

- A. Does this action apply to me?
- B. Where can I obtain a copy of this action and other related information?
- C. What is the effective date?
- D. Judicial Review

**II. Background**

- A. Why is EPA issuing this final action?
- B. Particulate Matter National Ambient Air Quality Standards
- C. Measuring PM Emissions
  - 1. Method 201A
  - 2. Method 202

**III. Summary of Changes Since Proposal**

- A. Method 201A
- B. Method 202
- C. How will the final amendments to methods 201A and 202 affect existing emission inventories, emission standards, and permit programs?

**IV. Summary of Final Methods**

- A. Method 201A
- B. Method 202

**V. Summary of Public Comments and Responses**

- A. Method 201A
- B. Method 202
- C. Conditional Test Method 039 (Dilution Method)

**VI. Statutory and Executive Order Reviews**

- A. Executive Order 12866: Regulatory Planning and Review
- B. Paperwork Reduction Act
- C. Regulatory Flexibility Act
- D. Unfunded Mandates Reform Act
- E. Executive Order 13132: Federalism
- F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments
- G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks
- H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use
- I. National Technology Transfer and Advancement Act
- J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations
- K. Congressional Review Act

**I. General Information****A. Does this action apply to me?**

This action applies to you if you operate a stationary source that is subject to applicable requirements to control or measure total particulate matter (PM), total PM with mean aerodynamic diameters less than or equal to 10 micrometers (μm) (PM<sub>10</sub>), or total PM<sub>2.5</sub>, where EPA Method 202 is incorporated as a component of the applicable test method.

In addition, this action applies to you if federal, State, or local agencies take certain additional independent actions. For example, this action applies to sources through actions by State and local agencies that implement condensable PM (CPM) control measures to attain the National Ambient

Air Quality Standards (NAAQS) for PM<sub>2.5</sub> and specify the use of Method 202 to demonstrate compliance with the control measures. State and local agencies that specify the use of Method 201A or 202 would have to implement the following: (1) Adopt this method in rules or permits (either by incorporation by reference or by duplicating the

method in its entirety), and (2) promulgate an emissions limit requiring the use of Method 201A or 202 (or an incorporated method based upon Method 201A or 202). This action also applies to stationary sources that are required to meet new applicable CPM requirements established through federal or State permits or rules, such as

New Source Performance Standards and New Source Review (NSR), which specify the use of Method 201A or 202 to demonstrate compliance with the control measures.

The source categories and entities potentially affected include, but are not limited to, the following:

Category	NAICS <sup>a</sup>	Examples of regulated entities
Industry .....	332410 .....	Fossil fuel steam generators.
	332410 .....	Industrial, commercial, institutional steam generating units.
	332410 .....	Electricity generating units.
	324110 .....	Petroleum refineries.
	562213 .....	Municipal waste combustors.
	322110 .....	Pulp and paper mills.
	325188 .....	Sulfuric acid plants.
	327310 .....	Portland cement plants.
	327410 .....	Lime manufacturing plants.
	211111, 212111, 212112, 212113 .....	Coal preparation plants.
	331312, 331314 .....	Primary and secondary aluminum plants.
	331111, 331513 .....	Iron and steel plants.
	321219, 321211, 321212 .....	Plywood and reconstituted products plants.

<sup>a</sup> North American Industrial Classification System.

#### *B. Where can I obtain a copy of this action and other related information?*

In addition to being available in the docket, an electronic copy of these final rules are also available on the World Wide Web (<http://www.epa.gov/ttn/>) through the Technology Transfer Network (TTN). Following the Administrator's signature, a copy of these final rules will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at <http://www.epa.gov/ttn/oarpg>. The TTN provides information and technology exchange in various areas of air pollution control.

#### *C. What is the effective date?*

The final rule amendments are effective on January 1, 2011. Section 553(d) of the Administrative Procedure Act (APA), 5 U.S.C. Chapter 5, generally provides that rules may not take effect earlier than 30 days after they are published in the **Federal Register**. EPA is issuing this final rule under section 307(d)(1) of the Clean Air Act, which states: "The provisions of section 553 through 557 \* \* \* of Title 5 shall not, except as expressly provided in this section, apply to actions to which this subsection applies." Thus, section 553(d) of the APA does not apply to this rule. EPA is nevertheless acting consistently with the purposes underlying APA section 553(d) in making this rule effective on January 1, 2011. Section 5 U.S.C. 553(d)(3) allows an effective date less than 30 days after publication "as otherwise provided by the agency for good cause found and

published with the rule." As explained below, EPA finds that there is good cause for these rules to become effective on or before January 1, 2011, even if this date is not 30 days from date of publication in the **Federal Register**.

While this action is being signed prior to December 1, 2010, there may be a delay in the publication of this rule as it contains many complex diagrams, equations, and charts, and is relatively long in length. The purpose of the 30-day waiting period prescribed in 5 U.S.C. 553(d) is to give affected parties a reasonable time to adjust their behavior and prepare before the final rule takes effect. Where, as here, the final rule will be signed and made available on the EPA website more than 30 days before the effective date, but where the publication may be delayed due to the complexity and length of the rule, that purpose is still met. Moreover, since permitting authorities and regulated entities may need to rely on the methods described in these rules to carry out requirements of the SIP and NSR implementation rules that become effective on January 1, 2011 (*see* section III.C, *infra*), there would be unnecessary regulatory confusion if a publication delay caused this rule to become effective after January 1, 2011. Accordingly, we find good cause exists to make this rule effective on or before January 1, 2011, consistent with the purposes of 5 U.S.C. 553(d)(3).<sup>1</sup>

<sup>1</sup> We recognize that this rule could be published at least 30 days before January 1, 2011, which would negate the need for this good cause finding, and we plan to request expedited publication of this rule in order to decrease the likelihood of a

#### *D. Judicial Review*

Under section 307(b)(1) of the Clean Air Act (CAA), judicial review of this final action is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by February 22, 2011. Under CAA section 307(b)(2), the requirements established by this action may not be challenged separately in any civil or criminal proceedings brought by EPA to enforce these requirements.

Section 307(d)(7)(B) of the CAA further provides that "[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review." This section also provides a mechanism for EPA to convene a proceeding for reconsideration, "[i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule." Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000,

publication delay. However, as we cannot know the date of publication in advance of signing this rule, we are proceeding with this good cause finding for an effective date on or before January 1, 2011, in an abundance of caution in order to avoid the unnecessary regulatory confusion noted above.

Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

## II. Background

### A. Why is EPA issuing this final action?

Section 110 of the CAA, as amended (42 U.S.C. 7410), requires State and local air pollution control agencies to develop, and submit for EPA approval, State Implementation Plans (SIP) that provide for the attainment, maintenance, and enforcement of the NAAQS in each air quality control region (or portion thereof) within each State. The emissions inventories and analyses used in the State's attainment demonstrations must consider PM<sub>10</sub> and PM<sub>2.5</sub> emissions from stationary sources that are significant contributors of primary PM<sub>10</sub> and PM<sub>2.5</sub> emissions. Primary or direct emissions are the solid particles or liquid droplets emitted directly from an air emissions source or activity, and the gaseous emissions or liquid droplets from an air emissions source or activity that condense to form PM or liquid droplets at ambient temperatures.

Appendix A to subpart A of 40 CFR part 51 (Requirements for Preparation, Adoption, and Submittal of Implementation Plans) defines primary PM<sub>10</sub> and PM<sub>2.5</sub> as including both the filterable and condensable fractions of PM. Filterable PM consists of those particles that are directly emitted by a source as a solid or liquid at the stack (or similar release conditions) and captured on the filter of a stack test train. Condensable PM is the material that is in vapor phase at stack conditions but condenses and/or reacts upon cooling and dilution in the ambient air to form solid or liquid PM immediately after discharge from the stack. In response to the need to quantify primary PM<sub>10</sub> and PM<sub>2.5</sub> emissions from stationary sources, EPA previously developed and promulgated Method 201A (Determination of PM<sub>10</sub> Emissions (Constant Sampling Rate Procedure)) and Method 202 (Determination of Condensable Particulate Emissions from Stationary Sources) in 40 CFR part 51, appendix M (Recommended Test Methods for State Implementation Plans).

On April 17, 1990 (56 FR 65433), EPA promulgated Method 201A in appendix M of 40 CFR part 51 to provide a test

method for measuring filterable PM<sub>10</sub> emissions from stationary sources. In EPA Method 201A, a gas sample is extracted at a constant flow rate through an in-stack sizing device that directs particles with aerodynamic diameters less than or equal to 10 µm to a filter. The particulate mass collected on the filter is determined gravimetrically after removal of uncombined water.

On December 17, 1991 (56 FR 65433), EPA promulgated Method 202 in appendix M of 40 CFR part 51 to provide a test method for measuring CPM from stationary sources. Method 202 uses water-filled impingers to cool, condense, and collect materials that are vaporous at stack conditions and become solid or liquid PM at ambient air temperatures. Method 202, as promulgated in 1991, contains several optional procedures that were intended to accommodate the various test methods used by State and local regulatory entities at the time Method 202 was being developed.

In this action, we are finalizing amendments to Methods 201A and 202 to improve the measurement of fine PM emissions. For Method 201A, the final amendments add a particle-sizing device to allow for sampling of PM<sub>2.5</sub> emissions. For Method 202, the final amendments will (1) revise the sample collection and recovery procedures of the method to reduce the potential for formation of reaction artifacts that are not related to the primary emission of CPM from the source but may be counted erroneously as CPM when using Method 202, and (2) eliminate most of the hardware and analytical options in the existing method. These changes increase the precision of Method 202 and improve the consistency in the measurements obtained between source tests performed under different regulatory authorities.

### B. Particulate Matter National Ambient Air Quality Standards

Section 108 and 109 of the CAA govern the establishment and revision of the NAAQS. Section 108 of the CAA (42 U.S.C. 7408) directs the Administrator to identify and list "air pollutants" that "in his judgment, may reasonably be anticipated to endanger public health and welfare" and whose "presence \* \* \* in the ambient air results from numerous or diverse mobile or stationary sources" and to issue air quality criteria for those that are listed. Air quality criteria are intended to "accurately reflect the latest scientific knowledge useful in indicating the kind and extent of identifiable effects on public health or welfare which may be

expected from the presence of [a] pollutant in ambient air \* \* \*." Section 109 of the CAA (42 U.S.C. 7409) directs the Administrator to propose and promulgate primary and secondary NAAQS for pollutants listed under CAA section 108 to protect public health and welfare, respectively. Section 109 of the CAA also requires review of the NAAQS at 5-year intervals and that an independent scientific review committee "shall complete a review of the criteria \* \* \* and the national primary and secondary ambient air quality standards \* \* \* and shall recommend to the Administrator any new \* \* \* standards and revisions of existing criteria and standards as may be appropriate \* \* \*." Since the early 1980s, this independent review function has been performed by the Clean Air Scientific Advisory Committee.

Initially, EPA established the PM NAAQS on April 30, 1971 (36 FR 8186), based on the original criteria document (Department of Health, Education, and Welfare, 1969). The reference method specified for determining attainment of the original standards was the high-volume sampler, which collects PM up to a nominal size of 25 to 45 µm (referred to as total suspended particulates or TSP). On October 2, 1979 (44 FR 56730), EPA announced the first periodic review of the air quality criteria and PM NAAQS, and significant revisions to the original standards were promulgated on July 1, 1987 (52 FR 24634). In that decision, EPA changed the indicator for particles from TSP to PM<sub>10</sub>. When that rule was challenged, the court upheld revised standards in all respects. *Natural Resources Defense Council v. Administrator*, 902 F. 2d 962 (D.C. Cir. 1990, cert. denied, 498 U.S. 1082 (1991)).

In April 1994, EPA announced its plans for the second periodic review of the air quality criteria and PM NAAQS, and the Agency promulgated significant revisions to the NAAQS on July 18, 1997 (62 FR 38652). In that decision, EPA revised the PM NAAQS in several respects. While EPA determined that the PM NAAQS should continue to focus on particles less than or equal to 10 µm in diameter (PM<sub>10</sub>), EPA also determined that the fine and coarse fractions of PM<sub>10</sub> should be considered separately. EPA added new standards, using PM<sub>2.5</sub> as the indicator for fine particles (with PM<sub>2.5</sub> referring to particles with a nominal mean aerodynamic diameter less than or equal to 2.5 µm), and using PM<sub>10</sub> as the indicator for purposes of regulating the coarse fraction of PM<sub>10</sub>.

Following promulgation of the 1997 PM NAAQS, petitions for review were filed by a large number of parties



SIP-approved pre-construction review permit, they are included in the title V permits. Obviously, title V permits should be updated to reflect any revision of existing emission limits or new emission limits created in the context of the underlying applicable requirements. Also, if a permit contains previously promulgated test methods, it is not a given that the permit would always have to be revised should these test method changes be finalized (e.g., where test methods are incorporated into existing permits through incorporation by reference, no permit terms or conditions would necessarily have to change to reflect changes to those test methods). In any event, the need for action related to emissions source permitting, due to these changes to the test methods, would be determined based upon several factors such as the exact wording of the existing operating permit, the requirements of the EPA-approved SIP, and any changes that may need to be made to pre-construction review permits with respect to CPM measurement (e.g., emissions estimates may be based upon a source test method that did not measure CPM or upon a set of Method 202 procedures that underestimated CPM emissions).

In recognition of these issues, the Clean Air Fine Particle Implementation Rule contains provisions establishing a transition period for developing emission limits for condensable direct  $PM_{2.5}$  that are needed to demonstrate attainment of the  $PM_{2.5}$  NAAQS. The transition period for CPM is the time period during which the new rules and NSR permits issued to stationary sources are not required to address the condensable fraction of the sources' PM emissions. The end date of the transition period (January 1, 2011) was adopted in the final Clean Air Fine Particle Implementation Rule (72 FR 20586, April 25, 2007) and in the final Implementation of the New Source Review Program for Particulate Matter Less Than 2.5 Micrometers ( $PM_{2.5}$ ) rule (73 FR 28321, May 16, 2008). As discussed in these two rules, the intent of the transition period (which ends January 1, 2011) was to allow time for EPA to issue a CPM test method through notice and comment rulemaking, and for sources and States to collect additional total primary (filterable and condensable)  $PM_{2.5}$  emissions data to improve emissions information to the extent possible. In the  $PM_{2.5}$  NSR Implementation Rule, we stated that as part of this test methods rulemaking, we would "take comment on an earlier closing date for the transition period in

the NSR program if we are on track to meet our expectation to complete the test method rule much earlier than January 1, 2011" (73 FR 28344). In the notice of proposed rulemaking for this final rule on amendments to Method 201A and 202, EPA sought comment on whether to end the NSR transition period for CPM early (74 FR 12976). In this final rule, EPA is taking no action to affect the already established January 1, 2011 sunset date for the NSR transition period.

Source test data collected with the use of this updated test method will be incorporated into the tools (e.g., emission factors, emission inventories, air quality modeling) used to demonstrate the attainment of air quality standards. Areas that are designated nonattainment for the 1997  $PM_{2.5}$  NAAQS, and that have approved attainment dates of 2014 or 2015, are required to develop a mid-course review in 2011. If it is determined that additional control measures are needed to ensure the area will be on track to attain the standard by the attainment date, any new direct  $PM_{2.5}$  emission limits adopted by the State must address the condensable fraction and the filterable fraction of  $PM_{2.5}$ . Additionally, the new test data could be used to improve the applicability and performance evaluations of various control technologies.

#### IV. Summary of Final Methods

##### A. Method 201A

Method 201A measures PM emissions from stationary sources. The amendments to Method 201A add a  $PM_{2.5}$  measurement device ( $PM_{2.5}$  cyclone) that allows the method to measure filterable  $PM_{2.5}$ , filterable  $PM_{10}$ , or both filterable  $PM_{2.5}$  and filterable  $PM_{10}$ . The method can also be used to measure coarse particles (i.e., the difference between measured  $PM_{10}$  concentration and the measured  $PM_{2.5}$  concentration).

The amendments also add a  $PM_{2.5}$  cyclone to create a sampling train that includes a total of two cyclones (one cyclone to segregate particles with aerodynamic diameters greater than 10  $\mu m$  and one cyclone to segregate particles with aerodynamic diameters greater than 2.5  $\mu m$ ) and a final filter to collect particles with aerodynamic diameters less than or equal to 2.5  $\mu m$ . The  $PM_{2.5}$  cyclone is inserted between the  $PM_{10}$  cyclone and the filter of the Method 201A sampling train.

The revised method has several limitations. The method cannot be used to measure emissions from stacks that have entrained moisture droplets (e.g.,

from a wet scrubber stack) because size separation of the water droplets is not representative of the dry particle size released into the air. In addition, the method is not applicable for stacks with diameters less than 25.7 inches when the combined  $PM_{10}/PM_{2.5}$  cyclone is used. Also, the method may not be suitable for sources with stack gas temperatures exceeding 260 °C (500 °F) when cyclones with screw-together caps are used because the threads of the cyclone components may gall or seize, thus preventing the recovery of the collected PM. However, the method may be used at temperatures up to 1,000 °F when using stainless steel cyclones that are bolted together rather than screwed together. Using "break-away" stainless steel bolts facilitates disassembly and circumvents the problem of thread galling. The method may also be used at temperatures up to 2,500 °F when using specialty high-temperature alloys.

##### B. Method 202

Method 202 measures concentrations of CPM in stationary source sample gas after the filterable PM has been removed using another test method such as Method 5, 17, or 201A. The CPM sampling train begins at the back half of the filterable PM filter holder and consists of a condenser, two dry impingers (temperatures maintained to less than 30 °C (85 °F)), and a CPM filter (temperature maintained between 20 °C (65 °F) and 30 °C (85 °F)). During the test, sample gases are cooled and CPM is collected in the dry impingers and on the CPM filter. As soon as possible after the post-test leak check has been conducted, any water collected in the dry impingers is purged with nitrogen gas for at least one hour to remove dissolved  $SO_2$  gas.

After the nitrogen purge, the sampling train components downstream of the filterable PM filter (i.e., the probe extension (if any), condenser, impingers, front half of CPM filter holder, and the CPM filter) are rinsed with water to recover the inorganic CPM. The water rinse is followed by an acetone rinse and a hexane rinse to recover the organic CPM. The CPM filter is extracted using water to recover the inorganic components and hexane to recover the organic portion. The inorganic and organic fractions are then dried and the residues weighed. The sum of both fractions represents the total CPM collected by Method 202.

#### V. Summary of Public Comments and Responses

In response to the March 25, 2009 proposed revisions to EPA Methods 201A and 202, EPA received public

comment letters from industry representatives, trade associations, State agencies, and environmental organizations. The public comments submitted to EPA addressed the proposed revisions to Methods 201A and 202 and our request for comments on whether to end the transition period for CPM in the NSR program on a date earlier than the current end date of January 1, 2011.

This section provides responses to the more significant public comments received on the proposed revisions to Methods 201A and 202. Summaries and responses for all comments related to the proposed revisions to Methods 201A and 202, including those addressed in this preamble, are contained in the response to comments document located in the docket for this final action (Docket ID No. EPA-HQ-OAR-2008-0348).

#### A. Method 201A

##### 1. Speciation

*Comment:* One commenter stated that EPA should include guidance in Method 201A concerning speciation of the constituents present in the PM<sub>10</sub>, PM<sub>10</sub>-PM<sub>2.5</sub>, and PM<sub>2.5</sub> size fractions. The commenter believes this information should be provided to support the use of speciated PM<sub>10</sub>, PM<sub>10</sub>-PM<sub>2.5</sub>, and PM<sub>2.5</sub> data in source apportionment studies.

*Response:* EPA did not revise the method to provide guidance for speciation of various particle fractions for source apportionment because Method 201A is not a speciation method. However, with judicious selection of filter media, sources may use this method for speciating the less volatile metals and use these data in source apportionment studies. Including details to adapt this method for speciation analysis would unduly increase the complexity of the method without increasing the precision of the mass measurements.

##### 2. Catch Weight and Sampling Times

*Comment:* Several commenters requested that EPA specify the minimum solids catch weights needed in the PM<sub>10</sub> and PM<sub>2.5</sub> size fractions to help testing organizations determine the necessary sampling times, especially for sources with low PM concentrations. Other commenters expressed concern about extended sampling times that would be necessary to obtain enough sample to weigh accurately. One commenter stated that a reasonable limit must be put on sampling volume to limit potentially unnecessary sampling time and exorbitant stack testing costs

that could quickly escalate with such a requirement.

*Response:* We agree with the commenters that collecting sufficient weighable mass is important for the method to be precise. We also understand that the sampling rate used to attain the cyclone cut-points is typically less than the rate used during Method 5 sampling. However, EPA did not revise the method to dictate a minimum sampling volume or minimum catch weight that would be necessary to obtain a valid sample. One reason for not specifying a minimum sampling volume or minimum catch weight is that different regulatory authorities and testing programs have differing measurement goals. For example, some regulatory authorities will accept less precision if results are well below compliance limits. State agencies or individual regulated facilities may develop data quality objectives (DQO) for the test program, which may specify minimum detection limits, and/or minimum sample volume, and/or catch weight that would demonstrate that DQO can be met. Stack samplers should take into consideration the compliance limits set by their regulatory authority and determine the minimum amount of stack gas needed to show compliance if the mass of particulate is below the detection limit.

Stack testers can use the minimum detection limit to determine the minimum stack gas volume. The stack tester may be able to estimate the necessary stack gas volume based on how much PM the source or source category is expected to emit (which could be determined from a previous test or from knowledge of the emissions for that source category).

Alternatively, the minimum detection limit for a source can be determined by calculating the percent relative standard deviation for a series of field train recovery blanks. You will not be able to measure below the average train recovery blank level, and EPA recommends calculating a tester-specific detection limit by multiplying the standard deviation of field recovery train blanks by the appropriate "Student's t value" (e.g., for seven field train recovery blanks, the standard deviation of the results would be multiplied by three). Short of having Method 201A field recovery train blanks for cyclone and filter components of the sampling train, you may use the detection limit determined from EPA field tests.

An estimated detection limit was determined from an EPA field evaluation of proposed Method 201A (see "Field Evaluation of an Improved

Method for Sampling and Analysis of Filterable and Condensable PM," Docket ID No. EPA-HQ-OAR-2008-0348). The estimated detection limit was calculated from the standard deviation of the differences from 10 quadruplicate sampling runs multiplied by the appropriate "Student's t value" ( $n - 1 = 9$ ). Detection limits determined in this manner were (1) Total filterable PM: 2.54 mg; (2) PM<sub>10</sub>: 1.44 mg; and (3) PM<sub>2.5</sub>: 1.35. These test runs showed more filterable particulate in the PM<sub>2.5</sub> fraction, and total filterable particulate detection limits may be biased high due to the small particulate mass collected in the fraction greater than PM<sub>10</sub>.

*Comment:* Two commenters questioned the use of reference methods to correct for ambient air in Section 1.5 of the proposed Method 201A. One commenter believed that the statement would be used as a means to blame non-compliance on ambient contributions and would result in legal challenges and disputes of test results. The other commenter questioned whether it was the intent of EPA to not allow the use of the CPM test method for low-temperature sources.

*Response:* We agree with the commenters that Section 1.5 of the proposed method was unclear. Thus, Section 1.5 (Additional Methods) has been removed from the final method. For sources that have very low PM emissions, such as processes that burn clean fuels (e.g., natural gas) and/or use large volumes of dilution air (e.g., gas turbines and thermal oxidizers), any ambient air particulate introduced into the process operation could be a large component of total outlet PM emissions. However, the decision to correct results for fine PM measurements to account for ambient air contributions is up to the permitting or regulatory authority. It is likely that these adjustments would be limited to gas turbines and possibly sources fired with clean natural gas.

*Comment:* Commenters expressed concern about the lack of a test method to measure PM<sub>2.5</sub> in stacks with entrained moisture. Another commenter urged EPA to continue work to identify or develop a method for measuring filterable (or total) PM at sources with entrained moisture droplets in the stack (e.g., units with wet stacks due to wet flue gas desulfurization or wet scrubbers). Commenters requested that EPA provide guidance or identify a viable alternative for high-moisture stacks as soon as possible. One commenter stated that when conducting emission testing at facilities with similar wet stack conditions as described in the proposal preamble (74 FR 12973), that they support EPA's position on the

# EXHIBIT 12



southeast (from west to east). The area is defined as that airspace upward from 700 feet above the surface within the area bounded by a line beginning at lat. 58°27'33" N, long. 134°37'40" W, to lat. 58°13'13" N, long. 134°11'51" W, to lat. 58°05'59" N, long. 134°21'04" W, to lat. 58°10'51" N, long. 134°59'18" W, to lat. 58°23'41" N, long. 135°31'13" W, to lat. 58°32'22" N, long. 135°18'32" W, to lat. 58°27'17" N, long. 135°01'27" W, thence to the point of beginning. This modification reduces the airspace area to only that area necessary to contain IFR operations as they transition between the airport and en route environments. Also, Class E airspace extending upward from 1,200 feet above the surface designated for Juneau International Airport is removed since this airspace is wholly contained within the Southeast Alaska Class E en route airspace, and duplication is not necessary.

This action also makes an editorial change to the Class D airspace legal description replacing Airport/Facility Directory with Chart Supplement.

## Regulatory Notices and Analyses

The FAA has determined that this regulation only involves an established body of technical regulations for which frequent and routine amendments are necessary to keep them operationally current, is non-controversial and unlikely to result in adverse or negative comments. It, therefore: (1) Is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) does not warrant preparation of a Regulatory Evaluation as the anticipated impact is so minimal. Since this is a routine matter that only affects air traffic procedures and air navigation, it is certified that this rule, when promulgated, will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## Environmental Review

The FAA has determined that this action qualifies for categorical exclusion under the National Environmental Policy Act in accordance with FAA Order 1050.1F, "Environmental Impacts: Policies and Procedures," paragraph 5–6.5a. This airspace action is not expected to cause any potentially significant environmental impacts, and no extraordinary circumstances exist that warrant preparation of an environmental assessment.

## Lists of Subjects in 14 CFR Part 71

Airspace, Incorporation by reference, Navigation (air).

## Adoption of the Amendment

In consideration of the foregoing, the Federal Aviation Administration amends 14 CFR part 71 as follows:

## PART 71 —DESIGNATION OF CLASS A, B, C, D, AND E AIRSPACE AREAS; AIR TRAFFIC SERVICE ROUTES; AND REPORTING POINTS

- 1. The authority citation for part 71 continues to read as follows:

**Authority:** 49 U.S.C. 106(f), 106(g); 40103, 40113, 40120; E.O. 10854, 24 FR 9565, 3 CFR, 1959–1963 Comp., p. 389.

### § 71.1 [Amended]

- 2. The incorporation by reference in 14 CFR 71.1 of FAA Order 7400.11C, Airspace Designations and Reporting Points, dated August 13, 2018, and effective September 15, 2018, is amended as follows:

*Paragraph 5000 Class D Airspace.*

\* \* \* \* \*

### AAL AK D Juneau, AK [Amended]

Juneau International Airport, AK  
(Lat. 58°21'17" N, long. 134°34'42" W)

That airspace extending upward from the surface to and including 2,500 feet MSL within a 3-mile radius of Juneau International Airport, and within 2.5 miles each side of the 271° bearing from the airport extending from the 3-mile radius to 5.2 miles west of the airport, and within 1 mile southwest and 2.6 miles northeast of the airport 135° bearing extending from the airport 3-mile radius to 5 miles southeast of the airport, excluding that airspace below 2,000 feet MSL within the area bounded by a line beginning at lat. 58°19'35" N, long. 134°24'31" W, to lat. 58°19'02" N, long. 134°25'33" W, to lat. 58°20'16" N, long. 134°27'28" W, to lat. 58°20'34" N, long. 134°26'22" W, thence to the point of beginning. This Class D airspace area is effective during the specific dates and times established in advance by a Notice to Airmen. The effective date and time will thereafter be continuously published in the Chart Supplement.

*Paragraph 6002 Class E Airspace Areas Designated as Surface Areas.*

\* \* \* \* \*

### AAL AK E2 Juneau, AK [Amended]

Juneau International Airport, AK  
(Lat. 58°21'17" N, long. 134°34'42" W)

That airspace extending upward from the surface within a 3-mile radius of Juneau International Airport, and within 2.5 miles each side of the 271° bearing from the airport extending from the 3-mile radius to 5.2 miles west of the airport, and within 1 mile southwest and 2.6 miles northeast of the airport 135° bearing extending from the

airport 3-mile radius to 5 miles southeast of the airport, excluding that airspace below 2,000 feet MSL within the area bounded by a line beginning at lat. 58°19'35" N, long. 134°24'31" W, to lat. 58°19'02" N, long. 134°25'33" W, to lat. 58°20'16" N, long. 134°27'28" W, to lat. 58°20'34" N, long. 134°26'22" W, thence to the point of beginning. This Class E airspace area is effective during the specific dates and times established in advance by a Notice to Airmen. The effective date and time will thereafter be continuously published in the Chart Supplement.

*Paragraph 6004 Class E Airspace Designated as an Extension to a Class D or Class E Surface Area.*

\* \* \* \* \*

### AAL AK E4 Juneau, AK [Removed]

*Paragraph 6005 Class E Airspace Areas Extending Upward From 700 Feet or More Above the Surface of the Earth.*

\* \* \* \* \*

### AAL AK E5 Juneau, AK [Amended]

Juneau International Airport, AK  
(Lat. 58°21'17" N, long. 134°34'42" W)

That airspace upward from 700 feet above the surface within the area bounded by a line beginning at lat. 58°27'33" N, long. 134°37'40" W, to lat. 58°13'13" N, long. 134°11'51" W, to lat. 58°05'59" N, long. 134°21'04" W, to lat. 58°10'51" N, long. 134°59'18" W, to lat. 58°23'41" N, long. 135°31'13" W, to lat. 58°32'22" N, long. 135°18'32" W, to lat. 58°27'17" N, long. 135°01'27" W, thence to the point of beginning.

Issued in Seattle, Washington, on November 1, 2018.

**Shawn M. Kozica,**  
*Manager, Operations Support Group, Western Service Center.*

[FR Doc. 2018–24721 Filed 11–13–18; 8:45 am]

**BILLING CODE 4910–13–P**

## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Parts 51, 60, and 63

[EPA–HQ–OAR–2016–0510; FRL–9986–42–OAR]

**RIN 2060–AS95**

### Testing Regulations for Air Emission Sources

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** This action amends certain existing testing regulations to reflect corrections, updates, and the addition of alternative equipment and methods for source testing of emissions. These revisions will improve the quality of data and provide flexibility in the use of

approved alternative procedures. The revisions do not impose any new substantive requirements on source owners or operators.

**DATES:** The final rule is effective on January 14, 2019. The incorporation by reference materials listed in the rule are approved by the Director of the Federal Register as of January 14, 2019.

**ADDRESSES:** The EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2016-0510. All documents in the docket are listed on the <http://www.regulations.gov> website. Although listed in the index, some information is not publicly available, e.g., confidential business information or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy. Publicly available docket materials are available electronically through <http://www.regulations.gov>.

**FOR FURTHER INFORMATION CONTACT:** Ms. Lula H. Melton, Office of Air Quality Planning and Standards, Air Quality Assessment Division (E143-02), Environmental Protection Agency, Research Triangle Park, NC 27711; telephone number: (919) 541-2910; fax number: (919) 541-0516; email address: [melton.lula@epa.gov](mailto:melton.lula@epa.gov).

**SUPPLEMENTARY INFORMATION:** The supplementary information in this preamble is organized as follows:

## Table of Contents

- I. General Information
  - A. Does this action apply to me?
  - B. What action is the agency taking?
  - C. Judicial Review
- II. Background
- III. Summary of Amendments
  - A. Method 201A of Appendix M of Part 51
  - B. Method 204 of Appendix M of Part 51
  - C. Method 205 of Appendix M of Part 51
  - D. General Provisions (Subpart A) of Part 60
  - E. Fossil-Fuel-Fired Steam Generators (Subpart D) Part 60
  - F. Electric Utility Steam Generating Units (Subpart Da) Part 60
  - G. Industrial-Commercial-Institutional Steam Generating Units (Subpart Db) Part 60
  - H. Small Industrial-Commercial-Institutional Steam Generating Units (Subpart Dc) Part 60
  - I. Municipal Waste Combustors for Which Construction is Commenced After December 20, 1989 and on or Before September 20, 1994 (Subpart Ea) Part 60
  - J. Glass Manufacturing Plants (Subpart CC) Part 60
  - K. New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces (Subpart QQQQ) Part 60
  - L. Method 2B of Appendix A-1 of Part 60

- M. Method 5 of Appendix A-3 of Part 60
- N. Method 5B of Appendix A-3 of Part 60
- O. Method 5I of Appendix A-3 of Part 60
- P. Method 7 of Appendix A-4 of Part 60
- Q. Method 8 of Appendix A-4 of Part 60
- R. Method 18 of Appendix A-6 of Part 60
- S. Method 22 of Appendix A-7 of Part 60
- T. Method 26 of Appendix A-8 of Part 60
- U. Method 26A of Appendix A-8 of Part 60
- V. Test Method 28WHH of Appendix A-8 of Part 60
- W. Performance Specification 1 of Appendix B of Part 60
- X. Performance Specification 2 of Appendix B of Part 60
- Y. Performance Specification 3 of Appendix B of Part 60
- Z. Performance Specification 11 of Appendix B of Part 60
- AA. Performance Specification 15 of Appendix B of Part 60
- BB. Performance Specification 18 of Appendix B of Part 60
- CC. Procedure 1 of Appendix F of Part 60
- DD. General Provisions (Subpart A) Part 63
- EE. Wool Fiberglass Manufacturing (Subpart NNN) Part 63
- FF. Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (Subpart DDDDD) Part 63
- GG. Coal- and Oil-Fired Electric Utility Steam Generating Units (Subpart UUUUU) Part 63
- HH. Method 303 of Appendix A of Part 63
- II. Method 308 of Appendix A of Part 63
- JJ. Method 320 of Appendix A of Part 63
- KK. Method 323 of Appendix A of Part 63
- LL. Method 325A of Appendix A of Part 63
- MM. Method 325B of Appendix A of Part 63
- IV. Public Comments on the Proposed Rule
- V. Statutory and Executive Order Reviews
  - A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review
  - B. Executive Order 13771: Reducing Regulations and Controlling Regulatory Costs
  - C. Paperwork Reduction Act (PRA)
  - D. Regulatory Flexibility Act (RFA)
  - E. Unfunded Mandates Reform Act (UMRA)
  - F. Executive Order 13132: Federalism
  - G. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments
  - H. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks
  - I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use
  - J. National Technology Transfer and Advancement Act (NTTAA) and 1 CFR part 51
  - K. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
  - L. Congressional Review Act (CRA)

## I. General Information

### A. Does this action apply to me?

The revisions promulgated in this final rule apply to industries that are subject to the current provisions of 40 Code of Federal Regulations (CFR) parts 51, 60, and 63. We did not list all of the specific affected industries or their North American Industry Classification System (NAICS) codes herein since there are many affected sources in numerous NAICS categories. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permitting authority for the entity or your EPA Regional representative as listed in 40 CFR 63.13.

### B. What action is the agency taking?

We are promulgating corrections and updates to regulations for source testing of emissions. More specifically, we are correcting typographical and technical errors, updating obsolete testing procedures, adding approved testing alternatives, and clarifying testing requirements.

### C. Judicial Review

Under section 307(b)(1) of the Clean Air Act (CAA), judicial review of this final rule is available by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by January 14, 2019. Under section 307(d)(7)(B) of the CAA, only an objection to this final rule that was raised with reasonable specificity during the period for public comment can be raised during judicial review. Moreover, under section 307(b)(2) of the CAA, the requirements that are the subject of this final rule may not be challenged later in civil or criminal proceedings brought by the EPA to enforce these requirements.

## II. Background

The revisions to testing regulations for air emission sources were proposed in the **Federal Register** on January 26, 2018 (83 FR 3636). The public comment period ended March 27, 2018, and 83 comment letters were received from the public; 23 of the comment letters were relevant, and the other 60 comment letters were considered beyond the scope of the proposed rule. This final rule was developed based on public comments that the agency received on the proposed rule.

## III. Summary of Amendments

### A. Method 201A of Appendix M of Part 51

In Method 201A, in section 12.5, the denominator of equation 24 is corrected

as proposed; the proposed  $c_p'$  in the denominator is changed to  $C_p'$  to be consistent with the nomenclature in section 12.1. The  $c_p$  in the numerator is changed to  $C_p$  also to be consistent with the nomenclature in section 12.1.

**B. Method 204 of Appendix M of Part 51**

In Method 204, in section 8.2, the statement regarding equation 204–2 is corrected to “The NEAR must be  $\leq 0.05$ ,” as proposed.

**C. Method 205 of Appendix M of Part 51**

In Method 205, section 2.1.1 is revised to allow the use of National Institute of Standards and Technology (NIST)-traceable transfer standards to calibrate the gas dilution system as proposed. The agency continues to believe that these standards are widely available and provide the accuracy necessary to perform the calibration. Section 2.1.1 is also revised as proposed to require testers to report the results of the calibration of the dilution system to enable the regulatory authority to review this information.

**D. General Provisions (Subpart A) of Part 60**

In the General Provisions of part 60, § 60.17(h) is revised as proposed to add ASTM D6216–12 to the list of incorporations by reference and to re-number the remaining consensus standards that are incorporated by reference in alpha-numeric order.

**E. Fossil-Fuel-Fired Steam Generators (Subpart D) Part 60**

In a change from proposal, the allowed filter temperature in § 60.46(b)(2)(i) is not revised. Based on comments we received on the proposed revisions, we are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating systems as part of this rulemaking. We will continue to review supporting information and data we received on the proposed rule and may propose either revisions or similar requirements as part of future rulemakings.

**F. Electric Utility Steam Generating Units (Subpart Da) Part 60**

In a change from proposal, the allowed filter temperature in § 60.50Da (b)(1)(ii)(A) is not revised. Based on comments we received on the proposed revisions, we are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating systems as part of this rulemaking. We will continue to review

supporting information and data we received on the proposed rule and may propose either revisions or similar requirements as part of future rulemakings.

**G. Industrial-Commercial-Institutional Steam Generating Units (Subpart Db) Part 60**

In a change from proposal, the allowed filter temperature in § 60.46b(d)(4) is not revised. Based on comments we received on the proposed revisions, we are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating systems as part of this rulemaking. We will continue to review supporting information and data we received on the proposed rule and may propose either revisions or similar requirements as part of future rulemakings.

**H. Small Industrial-Commercial-Institutional Steam Generating Units (Subpart Dc) Part 60**

In a change from proposal, the allowed filter temperature in § 60.45c(a)(5) is not revised. Based on comments we received on the proposed revisions, we are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating systems as part of this rulemaking. We will continue to review supporting information and data we received on the proposed rule and may propose either revisions or similar requirements as part of future rulemakings.

**I. Municipal Waste Combustors for Which Construction is Commenced After December 20, 1989 and on or Before September 20, 1994 (Subpart Ea) Part 60**

In a change from proposal, the allowed filter temperature in § 60.58a(b)(3) is not revised. Based on comments we received on the proposed revisions, we are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating systems as part of this rulemaking. We will continue to review supporting information and data we received on the proposed rule and may propose either revisions or similar requirements as part of future rulemakings.

**J. Glass Manufacturing Plants (Subpart CC) Part 60**

In a change from proposal, the allowed filter temperatures in §§ 60.293(f) and 60.296(d)(2) are not revised. Based on comments we received on the proposed revisions, we

are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating systems as part of this rulemaking. We will continue to review supporting information and data we received on the proposed rule and may propose either revisions or similar requirements as part of future rulemakings.

**K. New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces (Subpart QQQQ) Part 60**

In subpart QQQQ, in Method 28WHH, in section 13.5.1, equation 8 is corrected as proposed.

**L. Method 2B of Appendix A–1 of Part 60**

In Method 2B, in section 12.1, the definition of ambient carbon dioxide concentration is revised as proposed. The agency continues to believe that the global monthly mean  $(CO_2)_a$  concentration varies over time. Also, a website link is added to the definition as specified at proposal.

**M. Method 5 of Appendix A–3 of Part 60**

In a change from proposal, allowed filter temperatures in Method 5, sections 2.0, 6.1.1.2, 6.1.1.6, 6.1.1.7, and 8.5 are not revised. Based on comments we received on the proposed revisions, we are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating systems as part of this rulemaking. We will continue to review supporting information and data we received on the proposed rule and may propose either revisions or similar requirements as part of future rulemakings.

Section 6.1.1.9 is revised as proposed to allow the use of a single temperature sensor in lieu of two temperature sensors on the dry gas meter as allowed by Technical Information Document 19 (TID–19) and the approved broadly applicable alternative, ALT–117 (see <https://www.epa.gov/emc>). Consistent with our response to the comment regarding allowing flexibility for the weighing container in section 11.2.1, Method 5B, the first sentence in section 11.2.1, Method 5 is revised similarly.

**N. Method 5B of Appendix A–3 of Part 60**

In a change from proposal, the allowed filter temperatures in Method 5B, sections 2.0, 6.1, and 8.2 are not revised. Based on comments we received on the proposed revisions, we are deferring finalizing the proposed revisions of the temperature tolerances of probe and filter holder heating

# EXHIBIT 13

## **DECLARATION OF PATRICIA MACIELEWICZ**

I, Patricia Macielewicz, declare as follows:

1. My name is Patricia Macielewicz. I am over 18 years old. The information in this declaration is based on my personal experience and my review of publicly available information.
2. My primary residence is 2708 New York Avenue, Whiting, Indiana 46394. I have lived at my current address for over 70 years. I've lived in Whiting, Indiana for my entire life.
3. I have been a member of the Sierra Club since 2018.
4. The Sierra Club is a nationwide non-profit environmental membership organization, which has its purpose to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.
5. My home is approximately one half mile from BP's Whiting Refinery. I can see the facility's smoke stacks from my home. Because I live so close to the refinery, I am sure that I am exposed to pollution from the refinery, including particulate matter emissions.



6. My home abuts the Lost Marsh Golf Course, and I often spend time outside, behind my home feeding deer and other animals that wander behind my house and the back portions of the golf course.
7. The air pollution from the Whiting Refinery, including particulate matter pollution, is a major concern to me. When I am spending time outside, I can sometimes feel a burning in my throat and on my face. The air often feels heavy and is hazy, which makes me want to avoid taking deep breaths. When this occurs, I often have to retreat indoors to avoid the poor air quality. The air quality feels particularly bad when there is little or no breeze.
8. There are also bad odors that come from the Whiting Refinery that keep me from spending time outside and I must keep my windows closed because of the smell. I spend less time outside due to my concerns about air pollution from Whiting Refinery, and the poor air quality often prevents me from enjoying my yard, and doing other activities I enjoy, such as going on walks and feeding the animals outdoors.
9. The Whiting Refinery is also very noisy, due to fans and other pieces of equipment. I refer to the noise as the BP Symphony. The noise often keeps me from spending time outside when I otherwise would. The noise tends to be louder at night or early in the morning.



10. I have lived near the Whiting Refinery my entire life and do not have the financial means to move, despite the poor air quality and other impacts on my day-to-day life.
11. I am aware that BP's Whiting Refinery emits various air pollutants, including particulate matter, and that the U.S. Environmental Protection Agency sets limitations on particulate matter emissions due to adverse health and environmental effects. I understand that particulate matter includes small particles that can get deep into the lungs and cause serious health problems, including respiratory symptoms, such as coughing and difficulty breathing, aggravation of asthma and chronic bronchitis, heart problems, increased risk of lung cancer, and premature death.
12. I am 81 years old. I understand that elderly individuals and children are considered to be particularly sensitive to the health effects of particulate matter. As an elderly individual, I am very concerned about the impacts of the facility's emissions on my health.
13. I understand that Sierra Club is suing BP for violations of its particulate matter emission limitations at the Whiting Refinery. In light of my proximity to the Whiting Refinery, I am concerned about the plant's particulate matter violations.

14. If Sierra Club is successful in its challenge and BP is required to reduce its particulate matter emissions, it will improve air quality in my neighborhood. I will benefit from this reduction in harmful air pollution. Reducing my exposure to particulate matter would make me feel much more comfortable going outdoors and doing the activities I enjoy, and would also help address my health concerns related to particulate matter emissions.

I declare under penalty of perjury that, to the best of my knowledge, the foregoing is true and correct.

Executed February 12, 2020.

  
Patricia Macielewicz

# EXHIBIT 14

## **DECLARATION OF CAROLYN MARSH**

I, Carolyn Marsh, declare as follows:

1. My name is Carolyn Marsh. I am over 18 years old. The information in this declaration is based on my personal experience and my review of publicly available information.
2. My primary residence is 1804 Oliver Street, Whiting, Indiana 46394. I have lived at my current address for 32 years.
3. I am retired, but am an active bird conservationist and environmental activist.
4. I am a member of the Sierra Club. I first joined the Sierra Club in January 1990.
5. The Sierra Club is a nationwide non-profit environmental membership organization, which has its purpose to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.
6. My house is less than a mile from the BP Whiting oil refinery. The oil facility abuts a public park, Whiting Park along Lake Michigan. Because I

live so close to the refinery, I am certain that I am exposed to pollution from the refinery, including particulate matter (PM) emissions.

7. My passion is bird conservation. In the 1990s, I campaigned and organized to establish the Hammond Bird Sanctuary in Hammond, Indiana. I've also organized to mitigate/replace about 13 acres of bird habitat lost from golf course development in Hammond and preserved a Great Blue Heron and Great Egret rookery and bald eagle habitat from being developed into a law enforcement shooting practice range in southeast Chicago. I mostly spend my time outside walking, bird watching, as well as tending to my garden.
8. When I moved to Whiting, I didn't know about the Whiting Refinery. I just knew that there was an affordable house available near Lake Michigan, and I liked the "little city by the lake." At first, I wasn't conscious of pollution from the refinery, since I had worked at a steel mill in southeast Chicago before moving to Indiana, and was used to large industry. However, I eventually became interested in the Clean Air and Water Acts and the permitting process of the BP facility, since the plant had been around about a century. I thought it would be torn down as an outdated facility. I got involved with the permitting process when BP had to get approved to refine tar sands from Canada at the facility, which eventually became an air permit

lawsuit brought by Natural Resources Defense Council (NRDC), Sierra Club, and others.

9. The refinery has had spills since this lawsuit, and I've been commenting to challenge some of the facility's renewal permits up to every five years.
10. The BP facility is very loud and depending on the wind, it is particularly noisy when there is a southward wind. As mentioned earlier, the facility has a smell as well, that you can smell from miles away. The air quality is not good in Whiting because of this industry – there is dead, stale air, which I think is partially due to the PM emissions from Whiting Refinery. You feel unhealthy outside. You can also see the flames from the facility going up out of the towers of the facility, which impacts the aesthetics of the town. There is also a lot of secrecy surrounding oil spills by the facility, as the local paper does not often investigate BP accidents. Friends and I have tried to raise awareness about the oil spills impacting Lake Michigan, especially when there is oil sheen on the lake, but many people in Whiting don't talk about the problems of the facility, as I believe they are scared to talk badly about BP. Many local people grew up working at the facility. However, people were not told about how dangerous having an oil refinery by their homes can be. Interestingly, not too many people work at BP now, since it is a high tech plant. The workers that do work there are outside contractors and



commute into Whiting. Environmental activists are not given the attention they deserve, fighting the pollution emitting from this facility.

11. In terms of other impacts from the plant and industry in Whiting, the bird population has totally spiraled down. The difference from when I moved to Whiting 30 years ago versus today is staggering. The birds aren't in the parks in the numbers when I first became interested in finding migrating birds at Lake Michigan, Wolf Lake, and George Lake, and I attribute that to the chemical pollution emitted from the BP facility that have permeated the air.
12. The PM emissions are bad here – you can drive through the PM. The air quality looks and feels awful. People who were not born and raised here and visit or move to the Whiting area all say the same thing, that it is harder to breathe. The PM to me even has a smell. There is a huge number of people, particularly children, suffering from asthma in Whiting and surrounding neighborhoods.
13. I am aware that BP's Whiting Refinery emits PM, and that the U.S. Environmental Protection Agency sets limitations on particulate matter emissions due to adverse health and environmental effects. I understand that PM includes small particles that can get deep into the lungs and cause serious health problems, including respiratory symptoms, such as coughing

and difficulty breathing, aggravation of asthma and chronic bronchitis, heart problems, increased risk of lung cancer, and premature death.


14. I have recently been diagnosed with chronic obstructive pulmonary disease (COPD), which I attribute to the poor air quality in Whiting, especially the PM pollution. I am aware that the U.S. Environmental Protection Agency has determined that exposure to PM can cause chronic respiratory conditions such as COPD, and that older individuals are especially vulnerable to the health risks associated with short and long term PM exposure.
15. Due to my proximity to the Whiting Refinery, I have serious concerns about the PM pollution that comes from the facility and impacts upon my health. I have felt a real shortness of breath in the past year, and I definitely believe this is related to the PM pollution from Whiting Refinery. I spend less time outside because of my health concerns about exposure to air pollution and PM, particularly since I found out I had developed COPD. And while we very much feel the effects of the BP plant here in Whiting, we are very close to Chicago too, which is straight west of here. As a result, the pollution from this facility can have wide-ranging impacts not only on the local community but further away.
16. I understand that Sierra Club is suing BP for violations of its particular matter emission limitations at the Whiting Refinery. I am participating in

this case because BP needs to protect air quality better, which also means protecting the water quality of Lake Michigan, our drinking water.

17. If Sierra Club is successful in its challenge, and BP is required to reduce its PM emissions, it would help improve air quality in the area. I will benefit from the reduction in harmful air pollution. I would feel much more comfortable going outside, and I would feel better about my health concerns knowing that my exposure to PM pollution would be reduced and that BP would be deterred from emitting illegal levels of PM pollution in the future.

I declare under penalty of perjury that, to the best of my knowledge, the foregoing is true and correct.

Executed February 12, 2020.

  
Carolyn Marsh

# EXHIBIT 15

## **DECLARATION OF MAUREEN CONNOLLEY**

I, Maureen Connolley, declare as follows:

1. My name is Maureen Connolley. I am over 18 years old. The information in this declaration is based on my personal experience and my review of publicly available information.
2. My primary residence is 8525 Maple Avenue, Gary, Indiana 46403. I have lived at my current address for approximately 20 years.
3. I am currently retired from a career in nursing.
4. I am a member of the Sierra Club. I joined the Sierra Club in September 2017.
5. The Sierra Club is a nationwide non-profit environmental membership organization, which has its purpose to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.
6. My home is approximately 13 miles southeast of BP's Whiting Refinery.
7. I live in the Miller Beach community, only a few blocks from the shores of Lake Michigan.

8. The area has historically had poor air quality – especially in the 1970s. Since then, air quality has improved but over the last several years I’ve noticed a decline in the air quality.
9. The air is often hazy and even has a sulfur smell to it. I spend a lot of time biking in the area and taking walks down to the beach. The variability of air quality is noticeable. When the air quality is poor, it greatly impacts the aesthetics of the area. Miller Beach is so beautiful. It’s depressing to see it become polluted. I believe the excess particulate matter (PM) emissions from Whiting Refinery contribute to this problem.
10. Last year, I went cross-country skiing along the lake shoreline and I could see a fine ash on the snow, which I think was PM. It was a depressing sight. I think that the U.S. Environmental Protection Agency (EPA) should do more to ensure that the companies in the area, including BP, are not polluting our community.
11. My neighbors have also noticed that air quality has gotten worse over the last several years. Through online community forums, such as Next Door, people often comment on the state of the air quality. Some neighbors have even chipped in for a PurpleAir monitor to keep track of particulate matter levels and other air quality indicators. They post the data to a website ([millerbeach-air.com](http://millerbeach-air.com)) so that it is available to the community.



12. Many of my neighbors have respiratory problems and we also have a high percentage of vulnerable populations, such as the elderly and children. Poor air quality negatively impacts public health and is a major concern for me.
13. I know that BP's Whiting Refinery emits PM and that the EPA sets limitations on PM emissions due to adverse health and environmental effects. I understand that PM includes small particles that can get deep into the lungs and cause serious health problems, including respiratory symptoms, such as coughing and difficulty breathing, aggravation of asthma and chronic bronchitis, heart problems, increased risk of lung cancer, and premature death.
14. I understand that Sierra Club is suing BP for violations of its fine particulate matter (PM10) emissions limits at the refinery. I am participating in this case because governmental agencies are not protecting my community from harmful emissions such as the unlawful PM emissions from the refinery.
15. I believe that ensuring Whiting Refinery complies with its permitted PM emissions levels would reduce air pollution from the plant, and help improve the air quality in the area. I believe this reduction in unlawful pollution would help address some of my concerns stated above, including by reducing my exposure to PM pollution and stopping the negative impacts of pollution on the beauty of Miller Beach. It would also comfort me to know

that BP is being accountable for its unlawful emissions, and deterred from future violations.

I declare under penalty of perjury that, to the best of my knowledge, the foregoing is true and correct.

Executed February   11  , 2020

Maureen Connolly  
Maureen Connolly